What is the teacher's role in promoting online collaborative dialogue in a self-organised learning environment?

Michelle Whitehead

0835421

Submitted in accordance with the requirements for the degree of

Doctor of Education

The University of Warwick

Centre for Education Studies

October 2018

TABLE OF CONTENTS

Acknowledgements

I would be remiss if I did not acknowledge the many individuals who have helped me as I traversed this challenging journey. Dr Michael Wyness, thank you for your expertise and guidance, without which I would likely not have completed this research at all. Dr. Emma Williams, a fantastic mentor, thank you for your patience, persistence, encouragement, and belief in me. Your guidance and encouragement were more important than I can adequately express, particularly when I was dealing with challenging circumstances.

Finally, to my friends and family, particularly Paul, Mary and Rosalind, who inspired me to persevere and refused to accept that I could not complete this, even when I doubted myself. Thank you.

Declaration

The work in this EdD was developed and conducted by the author between October 2016 and September 2018. I declare that, apart from work whose authors are explicitly acknowledged, this thesis and the materials contained in this thesis represent original work undertaken solely by the author. I confirm that this thesis has not been submitted for a degree at another university.

Abstract

This EdD seeks to illuminate teachers' perceptions of the challenges and opportunities of promoting online collaborative dialogue in a self-organised educational program primarily to question if online learning changes the role of the teacher. It is underpinned by theoretical and philosophical frameworks that address the relationship between humans and technology and uses a phenomenological approach to, firstly, explore teachers' perceptions of their experiences about online dialogue and, secondly, to examine three examples of online dialogues, in order to understand more fully, what the role of the teachers is when a curriculum is delivered online in a self-organised learning environment.

The methodology of this project is a single case study of what I have termed 'Class X'. Class X is a unique programme, where teaching and learning is predominantly conducted via the use of technology and, in particular, online discussions forums. The methods used include interviews with teachers (n=3), and analysis of asynchronous discussions (n = 3; these are representative of the online discussions conducted by students in Class X).

Analysis of the interview data yielded four themes. Firstly, that the teacher's believed that online collaborative dialogue is more successful with students who have had prior technology experience. Secondly, that teachers believed that online collaborative dialogue is more successful when students have a higher academic base. Thirdly, that time, speed of process and choice of software were key factors that the teachers believed influence successful online

collaboration. Fourthly, that the role of the teacher in Class X is more peripheral as children who can self-organise through technology are more autonomous learners.

Analysis of the three asynchronous discussions revealed one primary finding. That teachers were critical to the process of online collaborative dialogue in Class X. Each of these themes was explored in further depth and the final analysis suggested that the perceptions of teachers about online collaborative dialogue was linked to the teachers' faith in technology. The teachers' views imply that the technology was the most important factor to online collaborative dialogue and not their guidance or instruction. Consequently, this research contributes to the active debate over how far technology has a hold on the ways human beings think and interact with each other, as well as the question of what human beings are coming to value and to see as valuable in the 'technological' age.

Chapter 1: Introduction

1.1 Setting the Scene

The 21st century has brought about massive changes and advances in the power of technology. In turn, this has brought about pressing questions for educators concerning the potential promise and challenges that technology offers to teaching and learning practices, particularly at school level. A particularly interesting phenomenon to have arisen in recent years is the adoption of technology and the adaption of classroom practices which incorporate networked collaborative learning. For example, networked collaborative learning environments predominantly involve the use of new online learning environments (such as Google Classroom), and these are effecting the way educators approach instruction and facilitate students' learning. From a researcher's viewpoint, networked collaborative learning creates a very interesting challenge and opportunity. This is not only because it raises questions about what type of learning is possible beyond the boundaries of existing systems and techniques, but also because it raises broader questions about the role of technology in human activity and interaction. Thus, networked collaborative learning has the potential to raise thought provoking philosophical issues that are not separable from teaching and learning.

At the heart of the philosophical issues is itself a debate about the nature of technology and how we as human beings are relating to it. It is currently a live question as to whether, as some have argued, our relationship to technology has changed to such an extent that technology has become a dominant force over humans. Philosophers such as Ellul and Heidegger believe technology has taken on a life of its own, which is stronger than any external influence as a result of the rise of the modern, industrial world (Ellul, 1964; Heidegger, 1977). On this view, technology is taken to be an autonomous force which threatens human freedom because it undermines the necessary conditions under which humans are considered to be rational beings. In this understanding, human beings are viewed as seeing the world as nothing other than the technological because they are controlled by the technological world in their pursuit of efficiency. At the same time, others argue that the relationship between human and technology is misinterpreted as one where technology is out of human control. On this view technology itself is a means to a human end. Consequently, technology is a tool of the digital age that humans can manipulate, and it is both necessary and imperative for human beings to do the things that they are already doing or want to do at faster speeds (Prensky 2001). Against these two polarising views of technology, the question of the educational value of networked collaborative learning becomes a wide and deep issue.

The instrumental view of technology affirms the belief that technologies are artefacts that act in and upon our lives, because technology is neutral. Thus, the only question to consider about humans and technology is the intent of the human use. We do not need to ask a question concerning technologies hold over humans, because a neutral object such as technology cannot possess a self-determining force. From an educational point of view, this has two main implications. Firstly, that if we pay heed to the instrumental view of technology when designing and adapting classroom practices, it is likely that students of the future may be exposed to more learning opportunities through media and online communication technologies. These potentially change the task of learning and acquiring knowledge and thus arguably technology may alter the learning experience for students and the teaching experience for teachers. Secondly, that the learners of the future may spend less time in a concrete social setting if technology will play a larger role in the delivery of the curriculum. As a consequence of this, their interactions may be more based on social networking practices, because as classroom practices become more connected, students will learn to access, manage, create and share knowledge differently. This has been seen with the extensive use of online tools such as Web 2.0 technologies that were designed to facilitate collaboration, communication and interactivity. Crucially then, technological innovation will challenge the view that children should be taught in one particular way.

The instrumental view of technology is perhaps the most dominant one in educational practice today. This presents both an opportunity and a challenge from a research point of view, as whilst there is a clear imperative for a forward thinking approach to designing education and learning provision that recognises the impact of technology, it is also sensible that we should be maintaining a critical perspective and not being too quick to assume the positive impacts of technology, especially in light of the philosophical skepticism about technology. This research seeks to contribute to the debates over the value of using technology in education, and particularly the value of networked connected learning. In particular, it seeks to explore and assess a recurrent assumption in contemporary literature and its implications. This is the view that increasing technology in the classroom to create new forms of learning using collaborative learning techniques will result in the teacher's role becoming more peripheral because the technology serves as a proxy tutor.

1.2 The Social Brain

Educationalists have long argued that we should make the "social brain" work for us, not against us, in the classroom. Human beings are social: we live and learn in the company of others and have a predisposition to engage with the social world. In evolutionary terms, this is demonstrated by the infant whose ability to form and maintain attachment bonds is instinct driven. Therefore, the popular conception of human nature is that we have a prevailing interest in being part of a social world and this motivation is primal; in other words, it is

critical not only to the success of our species but as a consuming part of our default social cognition network. Scholars such as Lieberman have linked this to the cause of our focus on the social world because he considered that creating and maintaining social connections for human beings is necessary and innate (Lieberman, 2015). If this is one of our distinguishable traits, hard wired by some form of utopian impulse to work with others, collaboration could be considered as constitutive of what it is to be human. It therefore makes evolutionary sense for us to seek out groups or communities from which to connect with. Furthermore, when we consider how the transmission and consumption of knowledge and information has evolved in the last decade, we can look towards the internet culture as a means of joining discourses across communities and combining a variety of other functions that contribute to collaborative knowledge building.

It has been argued that this desire to be connected is illustrated by the amount of time and frequency we spend on social networking sites such as Facebook, which is the most commonly accessed website in the world (over 1.94 billion active users). Added to the hypotheses that collaborative behaviours are accelerating as we engage in global-scale communications, this suggests we have developed a sense of optimism that everything is knowable and obtainable through technology and through collaborative thought. Dennett (2015) viewed this as a shift towards the power of the individual, where, armed with the tools of mass communication, one person has the potential to influence many. Dennett was indicative of the view that technology has exposed us to the

“transparency” which is afforded by an increase in digital freedom. This will create more influence from collective identities because the use of technology gathers its power from networking behaviours. This “return of power” Dennett spoke of relates to how the individual learner will be enabled through technology to determine the pattern of any future education. Consequently, for Dennett, education will become more of a private act, where people will share ideas within the open market place of the internet, which is a construct of authenticity from which the self-organised environment is based upon. Papert (1980) agreed, predicting that technology would eventually render obsolete almost all the features we would regularly associate with the structure of school, from the production-line mode of organisation, towards giving the reins of power in the hands of the children who he sees as a major force in producing educational change (Papert, 1980). Therefore for Papert, individualised learning was merely a consequence of revolutionising the dynamic system of the school. If our attitude towards technology and learning changes to view computers as revolutionary instruments instead of instruments of reaction, there will be less of a threat to the established order of the system. This, he believed, triggers a defence mechanism from the institution itself. Consequently, Papert views the transfer of power to the individual and away from the teacher within a schooling system as difficult, but nonetheless inevitable. This is because classrooms will be under pressure to change the structure, the content and the nature of schooling as the environment and teaching methods become more influenced by technology. Papert conjectured this on the basis that the very cohort of young people schools aim to educate has changed on account of the advent of

technology. This, Papert believes, is the reason why there is so much resistance to increasing technology in schools. We share a popular perception that the informational side or “wing” of technology is highly dominant because that is the one people can see and the one that really affects their lives. However, Papert believes technology is defined by two “wings”, the informational and the constructional, and despite advances in our acceptance of technology, we have become akin to only associating technology with the former. This, he believes, has deeply distorted how people think about technology, particularly in relation to education. Educational thinking about technology is, in effect, oversimplifying a complicated issue. In essence, Papert’s work serves to bring to the fore how technology can involve cooperation and collaboration dynamics, which are just as present in distant interactions and digital environments as they are within face to face contexts. This heralds a new way of thinking about cooperation and collaboration, and Papert hereby suggests that our understanding of learning, essentially a collaborative enterprise, should be re-defined to recognise the role of technology.

This is the position that the subject of this case study, Class X, appears to be taking, as it has designed a curriculum which is delivered online. This is because Class X believes that giving students more agency in the learning process through increasing technology is more relevant to young people’s learning preferences. Additionally, they define learners as “telestudents” of the future who should gain their knowledge and skills predominately by using Web

2.0 technologies. This, they believe, fundamentally changes the learner's relationship with their instructor because the "job of teaching" within Class X is considered more of an "assistant". What is happening in Class X is somewhat reminiscent of Keller (1968), who believed the growth of technology and the development of smart machines would render mass instruction redundant (Keller, 1968:88).

1.3 Defining Class X

The background to Class X, originates from the work of Sugatra Mitra (2001,2003, 2005, 2006). Mitra suggested that the self-organised learning environment (or 'SOLE') offers a credible alternative to tradition classroom practices as children can learn to 'think for themselves' when given access to the internet. This means, more specifically, that technology can enable children to (1) communicate and collaborate within communities of practice, and (2) develop more relevant and authentic educational knowledge. Mitra based his ideas around the principle that children are intrinsically digital, which means that young people can and will use the tools of technology without the instruction from an adult because they are born of the digital age. It is the active process of constructing ideas as a collaborative digital strategy that drives the concept of the SOLE – and indeed Class X. Mitra claimed that this intrinsic ability to use technology was demonstrated through his "hole in the wall research", which involved leaving a group of computer-illiterate school children in rural India with a computer which was installed in a wall. Without any prior instruction, the

children were found to be speaking in English words, browsing the internet with confidence and downloading content. Mitra took this as clear evidence of children's natural curiosity and desire to collaborate through the medium of technology. In summary, then, the SOLE is principled around the idea of the child as an independent knowledge builder, whose learning takes place in an authentic context that Mitra believed was a digitally enabled classroom.

However, when Class X is compared with other SOLE's it appears, on the surface, to be quite different. This is because Class X has taken the principle of self-organisation and used this to create a learning environment where students are in school alongside their peers. Nevertheless, they utilise the same collaborative digital strategies one would expect to see in a distance learning program, for, despite being in a face to face environment, they are expected to communicate and learn online. Class X believes that this configuration results in students developing a kind of freedom from external control that results in a transfer of power from teacher to student. Class X claims that this has resulted in a higher emphasis on student knowledge creation, problem solving, and authentic learning. Notably, these are key characteristics of Marc Prensky's (2001a) "digital native", which was a key concept of the SOLE paradigm. Class X aims to illustrate that, by promoting online dialogue with students as opposed to didactic teaching methods, students will gain a greater and deeper structural knowledge. Moreover, this collaborative approach to learning will ultimately result in the teachers' role becoming more peripheral. The students themselves

begin to take more responsibility for their own learning and will ‘self-organise.’

It is a central conception being Class X that, given the right digital environment, students will develop more of a cooperative approach to learning and will thus be enabled to construct their own knowledge through the medium of technology. However, this claim is centred around the idea that the computer is a pedagogic mechanism whose conditions enable emergent and self-organised learning to occur. So in effect, this implies that if the technology is removed children will not self-organise, because it is the technology itself which enables children to become self-organising. This suggests that technology is the most important factor for students to self- organise. This seems, on the face of it, to be quite a bold statement.

Research by Scardamelia and Bereiter (1991) argues that, although technology can increase the potential range and scope for emergent learning exponentially, considerable effort is required to ensure an effective balance between student agency and instruction. For that reason, they suggested that whilst technology is important, because students may not need teachers to teach, technology is not the most important factor, as students do need teachers to help them learn. In fact, their research indicated that whilst there are many opportunities and possibilities for children to take more of an active role in their learning, there was “no question of displacing the teacher” (Scardamelia and Bereiter, 1991:67).

A further critical question emerges when we consider how far Mitra's conception of SOLE and the conception of Class X connects with the constructivist pedagogy. On the face of it, the SOLE and the Class X complements with the constructivist tenet that students create meaningful and authentic learning experiences. However, at this point it is worth recalling that one of the chief tenets of Mitra's original concept of the SOLE is that learning can be achieved with minimal guidance from the teacher. Yet this appears, on the face of it, to challenge some key principles of constructivism as, whilst the rapid development of increasingly powerful computer and communication systems have great implications for the constructivist approach to education, this would be rather conceived as a platform for students and teachers to build knowledge *together*. Yet on Mitra and Class X's view there is a sense in which technology allows us to leave the child alone and makes the teacher's role redundant. Furthermore, while the theory of constructivism indeed emphasises that the responsibility of learning lies within the student, it also locates the teacher as a *facilitator* of learning. But in his vision of 'minimally invasive education,' Mitra believed that there is little need for the physical presence of the teacher, and this is the same position Class X is taking. This is connected to Mitra's core argument that our appetite for all things technological supersedes our need to be taught, and thus when a child is truly placed at the centre of an educational process the teacher will ultimately be reduced to a peripheral role in the learning process. Class X, which operates on a similar basis to Mitra's arguments, is similarly controversial. On the one hand it potentially illustrates how technology may affect the learning experience for the students and, on the

other, it challenges us to think about how increasing children's agency in the classroom through the collaborative interface of the internet may effect the role of the teacher.

1.4. The Structure of this Study

At this point, I am mindful to discuss how the challenges of looking at this example of online learning were met, and particularly how, at the eleventh hour, I had to alter my original research title and re-design my research methods. As I have pointed out, Class X is an unusual example of classroom practice because it combines online learning in a face to face environment. My original plan was to look at the perceptions of learning in this environment from the perspectives of both the students and the teachers. This was initially agreed to by the school and my methods were to include interviews with the teachers, a focus group with the students and an analysis of online discussions across the school year. However, half-way through my project the school decided they no longer wanted the children to form part of any face to face discussions. This was because they wanted to ensure I did not identify Class X. In addition, they decided I could only have access to three discussions. While I attempted to change their minds, I ultimately had to accept and respect their decision. I subsequently decided to think about how I could alter my research questions and focus. I had invested so much time already, and I still felt the research had merit. After much consultation I was able to change the research questions to focus upon the teachers' perceptions of online collaboration in Class X. The

school agreed to this new focus, under the premise that the school would be completely anonymised.

Nevertheless, this change in focus clearly impacted the depth and breadth of my data. Furthermore, there are other data that I did gather and which I was not able to include in my final EdD. For example I am only able to refer to the case as Class X, I am unable to discuss in any detail the school premises, the location, or the demographics. However, although I have not been able to present this information to the reader, it has informed my study and my discussion of Class X. Therefore, although what I am presenting here is not what I had originally planned, I still hope it can contribute in a small and original way, to the field of education and technology.

Given I must work within these limitations, my research thus proceeds as follows. I have carried out a case study of Class X, with the guiding aim of investigating to what extent the pedagogy of Project X is exemplified in practice. More specifically, my research aims to reveal the theory, or the beliefs and attitudes to learning exemplified by the teachers, matches the lived experience of leaning in the networked connected environment. I will address three research questions: (1) “What do teachers perceive to be opportunities in online collaboration?”; (2) “What do teachers perceive to be difficulties in online collaboration?”; (3) “How is participation patterned between students and teachers in an online discussion?”. To answer these I will be using interviews with teachers (n=3) and analysis of asynchronous online discussions (n=3).

As mentioned above, my topic raises crucial questions about the relationship between humans and technology and it is with such issues that I begin in my Literature Review. Here, I examine what might be seen as the pervasiveness of the relationship between human and technology since the beginning of human civilisation.

Chapter 2: Literature Review

2.1 Introduction to the Literature Review

I will begin the Literature Review by looking at human sociability from an evolutionary perspective in order to examine the arguments which support the idea that social groupings are fundamental to “being human”. This is followed by a discussion about the relationship between human beings and technology from the philosophical viewpoints of Heidegger and Ellul. As we shall see, their views are particularly pertinent to this study, particularly if technology is destined to become more implicated in human activities such as educational institutions. In the second section, I then address why the exponential rise in the use of online communication has formed the basis for many scholars and educators to argue that technology should be a more dominant influence in education. I explore both the more extreme technological determinist views, who view that all young people are avid technology users, and a more holistic view of human beings and technology, which views that, although technology is an important resource in education, it will not result in teaching and teachers becoming redundant. The final section makes an attempt to draw the first two sections together and look specifically at a replicable pedagogical approach of the massive online curriculums (MOOCS). These appear to be similar to Class X, as the design of MOOCS require the virtual presence of teachers rather than the instructional

presence of teachers. An analysis of some of the arguments which support a new relational configuration between teacher and student is provided here. In this way, the Literature Review ends by creating a platform for framing the title of this research: “What is the teacher’s role in promoting online collaborative dialogue in a self-organised learning environment? Some educators have sought to drive home the message that, in this age of the internet, knowledge is easily acquired without the presence of a teacher as groups of children can learn almost anything by themselves when given internet access and the ability to work collaboratively. It is the task of this research to explore these claims in critical detail.

2.2 “Being Human”

There has been a convergence of research in evolutionary psychology that holds that, although human beings inhabit a thoroughly modern world, we do so with the innate mentality of Stone Age man. Neuroscientist and human behaviourist Lieberman believed that this was because human beings are “hard wired to be social” – as being with others serves a fundamental need which is no less important or critical than that of food, shelter and water. To illustrate this point, he discussed how social pain affected the same part of the brain where we feel physical pain. Therefore when our social connections are threatened or limited we languish and suffer much in the same way as when we are physically harmed. As a result, human beings cannot pursue a good, healthy or complete life without the friendship of others because sociability is not accidental:

“despite the many ways friends can be useful to us, the fact that our friends are our friends is often an end in itself” (Leiberman, 2015, p. 25).

Thinking about the human desire to be part of a social group connects with Aristotle’s theory of the good life, which holds that leading the perfect life is one where we live well with others: “Man is by nature a social animal … Anyone who either cannot lead the common life or is so self-sufficient as not to need to, and therefore does not partake of society, is either a beast or a god.” (Aristotle, 350BC). This connects to Lieberman’s hypotheses that social desires lead us to seek out others not just because they are critical to our success, but because the connections we make are always in pursuit of some good. It is human nature to seek the “perfect friendship” of others. Aristotle sees this as an incidental process: “for it is not as being the man he is that the loved person is loved, but as providing some good or pleasure.” (Aristotle, VIII, 3.1156a14-19). Thus the action of seeking out social connections is linked to the human desire to live well, as purposeful human beings. Consequently, both Aristotle and Lieberman see the human desire to form friendships as deliberate because friendships serve a useful purpose. For Leiberman, this is indicative of the essential nature of what it is to be a living being and demonstrates why the human social brain has developed a “lifelong passion” to connect with others for a variety of purposes. Therefore, Lieberman approaches friendships more from an evolutionary perspective, because he sees the brain as the centre of the social self with its primary purpose being social thinking, whereas Aristotle sees friendships as central to a flourishing life. Certainly, as a society we have come

to associate the lack of friendships with something negative. In fact, we often assume that people who do not participate within social groups of some type are somehow incomplete or imperfect human beings because a life of social isolation is perceived to be, at the very least, un-human like.

A key part of Lieberman's hypotheses is that our social behaviour has varied in response to the change in social structure, and that cultural adaptation is a key factor in these changes. Thinking more specifically about our social activities in the current day and age, it is suggested that we are beginning to decline many things that are physically "social" in favour of accessing social media. This suggests something dramatic has changed in terms of how we view our social connections. This can be illustrated with the work of Kraut *et al* (1998) who, in their study of Internet use during 1995-96, found a decline in social involvement from frequent users (Kraut et al*,* 1998). Another example is Carlell (2001) who found that technology made users retreat from physical social engagements. This suggests that whilst we are still motivated by the need for social connection, we are frequently choosing to socialise online and this has undoubtedly influenced many commentators to argue that our current educational model no longer makes sense in the context of the technology pervasive environment.

From even these initial considerations we see how questions concerning technology extend into deeper philosophical questions about the nature of the human being and social life today. One of the key issues here, as I see it,

whether the relationship between humans and technology can be seen as natural. This brings me to consider the relationship between humans and technology more closely – and at this point I shall turn to the dual constitution of technology, as suggested by the 20th Century German philosopher and phenomenologist, Martin Heidegger.

Heidegger argued that 'we can learn thinking only if we radically unlearn what thinking has been traditionally' (Heidegger, 1968:8). This is interesting in the context of thinking about developing different forms of education and relevant to the present case study project for two main reasons. Firstly, it suggests when it comes to educating ourselves and designing education for others, we are creatures of habit and therefore gravitate towards the tried and tested. Secondly, Heidegger believed education should be approached phenomenologically, that is, being conceived within the realms of experience from which it originates rather than through a more detached and objective scientific view of the world that he believed restricts our everyday understanding. Consequently his vision of education is described as the view of learning as a process which is not bound by rules, laws, prejudices or goals of past thinking. The "unlearning" Heidegger refers to points to locating the 'here and now' of education. The implications of these broader thoughts come to light in a particularly significant way when consider the use of digital technologies in education.

Certainly, Heidegger, as discussed in his essay “A Question Concerning Technology”, believed that the predicament of modern man’s situation is that we are in danger of “manufacturing ourselves” rather than existing with the “openness for being.” Heidegger believed was the consequence for man when they only know themselves as an instrument ready for use. For Heidegger, the very essence of technology should concern us, that is, how we have acted too much and thought too little. For Heidegger, between our desire to progress and our desire to learn faster, we have forgotten the craft of thinking and have become preoccupied with technology. Postman (1995) agrees to some extent, cautioning that we are at risk of rejecting a critical attitude when it comes to talking about technology. Postman argues that technological innovation has come to be likened to “gifts from the gods”, which gives technology a somewhat ethereal status, creating a powerful type of faith that values certain perspectives and subordinates others (Postman 1995). Heidegger seems to agree with Postman here, as he saw this ethereality as a phenomenon of technology which has a controlling force over man. Heidegger likened this to the dominating force of technology, which has all but eliminated our ability to experience things non-technologically. For Heidegger, taking a phenomenological approach enables the understanding of meaningful and practical realms – realms are at risk of forgetting and forsaking in the pursuit of the technological. Heidegger explains this further in his example of the hydroelectric plant based on the River Rhine. Once revered for its natural beauty as part of the landscape, the Rhine it is now considered a power station. Its essence is derived out of the essence of a power station, rather than the huge body of water that it is. For Heidegger, this

is an example of the concealment he spoke of in which modern technology has the ability to transform and predominant in how we look at things: just as the river comes only to be known for its ability to dispatch electricity.

Heidegger sees this as a dangerous path that effectively treats human capabilities as though they were only means for technological procedures. This is akin to a worker who becomes nothing but an instrument for production. Consequently, he believed that if we push aside or simply cannot see other possibilities for technology we will only ever believe that it is nothing but a blessing. Heidegger and Postman therefore share the same concerns about technology as, for both, new technology does not merely add something - it changes it, offering in equal measures advantage and disadvantage. For Heidegger at the heart of the matter is that we should challenge the all-pervasive way we confront and are confronted by the technological world. We must attempt to understand things non-technologically, which we are at danger of disregarding if we lose the openness to explore different possibilities.

Therefore Heidegger's overarching concern when humans consider their relationship with technology is that they tend to focus on an instrumental view of technology, which sees technology as a neutral and thus merely a tool for human use. As this view of technology is based on the idea that technologies are tools, standing ready to serve the purposes of their users, the instrumental theory holds that technology can be the servant of human values and is value free: neither good nor bad in itself. Therefore, what counts is not the technology

but the way in which we choose to use it. On this view the relationship between the human and technology is one of material gain. This proposition is based on the acceptance of technology's popularisation over the past decade. In the context of education, it forms the basis to argue that education should be moving towards the acquisition of modern education goals.

However, there is a second and equally important aspect to this relationship which Heidegger referred to as "revealing." This takes technology as a phenomenon. Regarded by many as the first philosopher who recognised the ontological status of technology addressed most explicitly in his essay "A Question Concerning Technology" (1977), Heidegger believed that humans have primacy and control over technological engagements and this is central to the core concept of "being human." Put otherwise, the tools we use determine our view of the world. This connects to the idea that humans have always utilised tools because we manipulate our environment for both survival and efficiency in order to engage with the social world. However, one major concern for Heidegger was that human engagement with tools inform the dystopian view in which information technologies are considered tools. Heidegger sees technology as a distinctive way of revealing or relating to reality, because it is never simply under conscious human control.

So, for Heidegger, it is important to examine the "free relationship" between humans and technology, because the very essence of technology or "hypokeimenon" is not the technology itself as "the essence of a thing is

considered to be what the thing is" (Heidegger 1977:3). This means that it is not the properties of an object that determines its reality, it is "the connection to our life". So, for Heidegger, technology is not a neutral tool and not simply a means to an end. Rather, it is a way of life routed in technical enterprise. Heidegger viewed the instrumental conception of technology as one dimensional because it does not fully capture the essence of what technology is. Heidegger therefore views that there is another aspect of technology that is related to how humans appreciate and experience being as a whole and for Heidegger, this view is equally as important because it captures technology as "a way of revealing being" (Heidegger 1977). According to Heidegger, if we are ever to transcend the technological, we must first come into a new relation with technology, that is, essentially, one that does not view technology as a neutral tool. Heidegger's views are based on the idea that because we have an overwhelming instrumental view of technology, we have come to wilfully allow the modem technological view to take over our reality. Likewise, we have also come to view anything technological as positive, because we do not take a critical attitude towards it. Furthermore, Heidegger believed that technology is aligned with a sense of necessity that he argued endangers man in his relation to himself and everything that is. This, for Heidegger, constitutes the most dangerous form of determinism as it denies the essential notion of freedom.

In a similar vein, the French philosopher and social critic, Jacques Ellul, believed that because humans adapt to the demands of technology and technology does not adapt to the demands of humans, "modern technology has

become a total phenomenon for civilisation, the defining force of a new social order in which efficiency is no longer an option but a necessity imposed on all human activity" (Ellul 1964). Just as we are attracted by the power of the tools of technology, we become more and more driven to pursue it. This results in technology become more necessary and more powerful; thus Ellul believed that we are condemned to pursue it and also condemned to be exploited by it. At the core of Ellul's philosophy is the idea that society is too caught up with technology because we are constantly looking to do speed up all of the processes of human activity.

Ellul views technology as an expression and a by-product of our underlying reliance on the "technique." Ellul takes this to be a technological mentality and structure, which pervades on all social life insofar as everything is organised to function in the most efficient and productive way. Within his book, *The Technological Society*, Ellul's issue was not with the machines of technology but with a society that is caught up in efficient methodological techniques: "Technique is the totality of methods, rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity"(Ellul, 1964, p. xxv). So, for Ellul, the problem with the "technique" is that it represents a type of technological mentality and structure that he sees pervading in all social life, because human beings are preoccupied with efficiency and organisation that in turn gives the "technique" a controlling power.

Ellul believes that we have reached a state of technological determinism, because “technique” is self-perpetuating, all-pervasive, and inescapable. This suggests, unlike the hypothesis of Heidegger, that we are too late to take control over technology because since technique has become the new milieu and all social phenomena are situated in it. Consequently, our obsession with “knowing how” has blurred the real nature of our relationship with the technological and, for substantive theorists like Heidegger and Ellul, it is this “technological pervasiveness” that causes the most concern when we think about the relationship between humans and technology. So, on one side of the argument, there are the optimists: the “technological determinists” who believe that education can only benefit from an increased use of digital technologies in similar ways to how it has benefitted other areas of society. On the other, however, there are the pessimists: those who see technology innovation more negatively and caution against being over optimistic about its ability to shape and change education for the better. It is these more pessimistic views that the work of Heidegger and Ellul serve to exemplify.

As we have discussed, both Heidegger and Ellul approach the concept of technological pervasiveness as a concerning consequence to our immersion in all things digital. However, these philosophers challenge technology’s hold over humans differently, with Ellul believing that any opposition to the technological is simply absorbed as we become addicted to the products of technology, and Heidegger, who accepted the positionally of technology, but spoke of “the call of a more primal truth” that stressed the importance of questioning the essential

nature of technology, as seeing a way beyond our technological immersion (Heidegger 1977: 28). Heidegger accepted that we live in the information age, but he did not think we are not as powerless against technology as Ellul suggested. For Heidegger, we can prepare for it by transcending the technological revelation of reality to develop a new relation to technology. This for Heidegger means that human beings must cease to understand technology in the traditional fashion and cease to see technology as a neutral tool.

It could be said that Heidegger's arguments, made in the 1970s, have been borne out in the decades that have followed. Educators and philosophers alike have been arguing long and hard about technology and how technology affects human activity. On the one hand, we are enthusiastic to manipulate the tools of technology, particularly as it enables us to process and organise information seamlessly. Yet, on the other hand, we remain reticent to allow technology to permeate certain processes such as learning. At this point, I should like to turn to consider a particular argument that permeates most discussions about increasing technology in education and one that locates that young people, as a result of their experiences with technology, as "digitally native." On this view, young people possess more sophisticated knowledge and skills with information technologies than the older generation, because they have never lived at a time when it was not present (see for example Prensky 2001a, 2001b). These assumptions are interesting in the context of Class X, because they have several convergent points with the pedagogical approach of collaborative learning with technology. Therefore, as a way of framing the next part of the

discussion, I will begin by discussing the “digital native” beginning with looking at the basic assumption that the world that people experience with information technology is different from the world without it.

2.3 “The Digital Native”

Since technology is increasingly interwoven in all contexts of human life, it does seem plausible to assume that it might to some extent constitute and give shape to some of the more significant experiences in our lives, such as our schooling experiences. This immersion in all things technological has resulted in the idea that young people, as a result of their interaction with technology, think and process information fundamentally differently from their predecessors. Therefore, as a result of their exposure to digital technologies, they possess specific and unique characteristics of processing and accessing information that makes them completely different from those growing up in previous generations. The term “digital natives” was originally coined by author Marc Prensky, and is premised on the belief that the high level of familiarity a student has with technology make their relationship irreducible. Prensky uses this as a justification to expand participation in key technological choices, such as education. This has influenced the view that technology must be understood relationally to human beings, because the ideologies and beliefs of individuals, as well as structural forces at play, influence what evolves in our social practices, such as education.

At the core of Prensky's argument is the apparent disparity between the technological skills and interests of the "digital natives" and the limited and unsophisticated technology of the older generation. This, for technologists like Prensky (2001a, 2001b), is the reason why the current pedagogies employed in education are ill-suited. More directly, he claims that students have changed so radically that they are, in effect, "no longer the people our educational system was designed to teach" (Prensky, 2001, p.1). Consequently advocators of the "digitally native" contest that traditional education is unprepared and unfit in its current form because it does not appeal to young people and it does not develop the implicit skills necessary for discovery based and networked learning most akin with digitally native learners.

There are two fundamental assumptions in the rhetoric around the digitally native: (1) that the digital native exists; (2) that education must fundamentally change to better meet the needs and particular skill sets of the net generation. These views form the basis for the proposition that institutions like schools should be developing strategies which recognise the influence and potential of the internet in supporting more formal learning activities. At the core, Prensky's arguments appear to be principled around addressing whether "being human" should be re-conceived as "being human in a technological age". This is the position Class X is taking, believing that the optimum strategy for learning is one which recognises the "digital natives'" natural co-evolution with machines. Class X believes that social learning can be facilitated through communication technologies, and that they are just another, albeit more modern, form of social

group. Through this conceptual base, Class X perceives that their educational model is more meaningful and more authentic because firstly, their philosophy is based on the principles of embracing human sociability and secondly, that technology is pervasive. This, they see, is a more natural approach to learning as it attuned within a cultural context.

I shall return to say more about Class X in the next chapter, but for now it is worth noting that there are many examples within the seminal literature on digital natives that suggest that the idea of a distinct group of technologically advanced net generation is misplaced (see for example: Bennet, Maton and Kervin 2008; Facer & Furlong 2001; Livingstone & Helsper, 2007 and Hargittai 2008). This is supported by several studies that assessed the use of technology by various groups of students, which is one of the key factors Prensky claimed gave rise to the "digitally native" concept. For example, an Australian study by Kennedy *et al* (2007) found that students "were nowhere near as frequent users of new technologies as some commentators have been suggesting" (Kennedy et al 2007,p. 523). They argued that this dispelled the myth that all those born after 1984, (Prensky's official date for the net generation) have sophisticated technical digital skills. Certainly, in this particular example, there was a significant proportion of students who had lower level skills than might be expected of digital natives, and this gave rise to a general sense that generalisations about the competencies of digital natives were unfounded. Another cross-cultural study conducted by Li and Ranieri (2010) similarly concluded that students' familiarity with technology was not an indication of

whether they were able to use technology competently for academic purposes. This was almost identical to the research by Partosoedarso *et al* (2013) who claimed that the majority of students used technology most frequently for social use and rarely for educational purpose. As they claim: “students’ use of everyday ICT for socialising and entertainment purposes … does not necessarily transfer over into skill full use of ICT for learning”. Equally, Livingston and Bober (2004) found that whilst children are enthusiastic to use technology as a communication medium, they are less so about using the computer for academic purposes. In addition, they agreed that there are vast differences between the technological abilities and the skill sets of young people. This view was also shared by Sanchez, Salinas, Contreras, Meyer (2010) who found that digital competence is more determined by the cultural practices of groups than by generational effect. Finally Selwyn (2009) noted that “young people's engagements with digital technologies are varied and often unspectacular in stark contrast to popular portrayals of the digital native”. Consequently, there is a strong sense that technological determinism underpins the concept of the digital native – this links us back to the concern of philosophers like Heidegger and Ellul.

What these examples help to demonstrate is that there is a significant proportion of research that does not support claims that young students use digital technologies in a radically different manner, or have a significantly different set of characteristics, from previous generations. Furthermore, these particular research examples reject the idea that young people represent a

homogenous group of technology users as Prensky suggested, and rather suggests that young people do use a large quantity and variety of technologies. Therefore there is an overwhelming sense of an over estimation about the existence of a “net-generation” because the majority of research has shown that, although learners in this generation have only experienced a digital connected world, they do not use technologies in the way which is often ascribed to them. This is because most of the evidence points to the fact they use technology primarily for communicative reasons and not to support their learning. It is therefore difficult to reason why the concept of the digital native can be used as a motive to implement pedagogies that increase communication technologies in the classroom, such as Class X.

However, the core issue remains that the concept of the “digital native” is an important subject in education. If there is indeed a digital disconnect between one generation and another, this has implications for both teaching and learning. Based on Prensky's original concept, teachers of the “digitally native” lack digital knowledge and skills; in Prensky’s words, they do not talk the same language (Prensky, 2001a). Tapscott (1998) believed this is due to the generation lap, and Prensky agreed. Consequently, they both believe exposure to, and experience with, technology is critical. However, if the term “digitally native” is determined by immersion within a technological environment as Tapscott suggested, then this would suggest all people born within Prensky’s “digital age” should have the skills to talk the same digital language. However, as has been deliberated, this assumption has also been highly contested and

much of the research findings show that many young students are far from being the technologically-fluent digital native of which Prensky spoke.
In essence, then, there are legitimate concerns about the assumption that children are “digitally native”. At the same time there is much dialogue that suggests new technologies have altered our social practices, so much so that we have moved away from being a tool using culture in which tools do not affect the integrity of the existing culture, towards a technocracy, in which tools play a central role in the thought world of the culture.

The concept of the “digitally native” is one that perceives technology as shaping human behaviour, and which views technology as an autonomous system. In this view, human behaviour is, to a greater or lesser extent, shaped by technology. Postman (1993) believed this is an example of what he termed as “technopoly”: where we move from a society that uses technological tools to a society that is governed and controlled by technology. For Postman, this is a question of the technological domination of society, because technology is both a state of mind and a state of culture. He therefore contested the view that human beings control technology, as technology must be situated as a monopoly of power in our society: “we seek our authorisation in technology, find our satisfaction in technology and take our ordering from technology” (Postman 1993, p.71). Similarly, Aoki (1999) also understood that the application of technology cannot be fully understood as instrumentally reductive because technology cannot be separated from the situation. Therefore, whilst he acknowledges that “what the situation demands must not be ignored”, he also

cautioned us against understanding the relationship between humans and technology as being detached (Aoki 1999, p.155). From this perspective, Postman, Aoki, Heidegger and Ellul all characterise the belief that in order to understand the relationship between human experience and technology, one must consider how technology is considered to intervene in, and condition, human experience.

These lines of thought work to suggest that, although there is a sense of enthusiasm that surrounds increasing technology in classroom contexts, broadly based around the idea that it forms part of the fabric of modern society, the popularised notion of today's students as “digital natives’ is contested. This suggests tension between the idea that technology determines human action and the idea that human action shapes technology. This raises some very interesting and important questions about the nature of our relationship with communication technologies and how this relationship might affect, for example, the teacher and student relationship. This connects to the dual constitution of technology, as suggested by Heidegger, where it is both reasonable and necessary to explore how technology intervenes with and conditions human experiences because “as long as we represent technology as an instrument we remain held fast in the will to master it” (Heidegger 1977, p.32). Therefore, in the next section, “How Connected is the World?”,I will examine how a pedagogical shift from an oral communication environment towards one which is complemented by technology may affect the teacher-student relationship.

The growth of emergent textual practice in young people represents a significant shift in practices of communication when compared with previous generations. This is because it has been suggested that technology could bring new forms of literacy and learning practice that young people engage with more centrally as “digital natives”. Whilst there is agreement that new technologies have brought fundamental changes in the way we communicate, such changes have also been conceptualised from different theoretical perspectives. In context of Class X it is useful to consider one in particular: that “digital natives” are so immersed within technology that their normative modes of communication have altered. This means they are breaking away from normative, basic interaction modalities in the pursuit of a more textual based communication.

There has been some support for this argument, particularly with research focusing on network behaviours, which suggest that we have a growing preference for using text communication over face to face communication. This constitutes a change in “network capital” as we perceive the collective aggregation of information afforded by technology ultimately leads to better decisions than those any individual might make (Surowiecki, 2004, Tapscott and Williams, 2006, Wellman et al 2002). In a similar vein, after their empirical study of media and technology usage and attitudes by young people, Rosen *et al* (2013) argued that face to face interactions have become the third method of communication behind text messaging in just a matter of a few years. This, they proposed, was primarily due to the advent of portable technology. By changing

the communication landscape, portable technology has created the means for people to access the Internet and use applications anywhere and at any time of the day or night. Veen and Vrakking (2006) were also indicative of this view, believing that our increasingly reliance on technology to connect, and our effortless ability to adopt technology and share information within networks, is just one characteristic of a new breed of learners they classified as the “Homo Zappiens”. Although similar to the concept of Prensky’s “digital native”, Veen and Vrakking suggested that the technological skills which are unique to the “Homo Zappiens” have developed without assistance. In this sense, it is similar to Mitra’s concept of the self-organised learner, whilst Prenksy based his “digital native” concept upon a rationalisation of the phenomena and behaviours that he had observed. However, in discussions of what constitutes the new generation and what unique characteristics make up its members, it is broadly agreed that young people’s preferences for images and symbols as an enrichment of plain text is one key example of how technology has changed the key social process of communication.

Such views certainly appeal to the rhetoric around the “digitally native.” However, as we examined above, there is limited empirical research which supports the idea that young people will transfer the technological skills they use to communicate into a support for learning. It is likely, however, and given that digital literacy is considered to be the pillar of 21st century skills, that the use of communication technologies in the classroom will increase – particularly when the concept of the “digital native” has a certain appeal. Consequently,

there is a basis for exploring how learners can exert both interaction and independence with the sorts of “hybridised and intersecting texts” associated with online communications and how this may affect the relationship between the student and the teacher (Livingstone, 2011, p.1). This brings me to consider the impact of increasing communication technologies in the classroom, making specific references to how the Internet has influenced the structure of teaching and learning.

2.4 “All Hail the Internet”

The emergence of Web 2.0 technologies, particularly the internet, has opened up opportunities for new forms of communication and knowledge formation both inside and outside of formal educational institutions. Some have suggested that this leaves traditional ways of searching for available information ineffective and irrelevant in the context of this new landscape of digital learning. The ability to access relevant information and communicate within this vast community of learners is being increasingly recognised by individual, organisations and institutions, although some have suggested that education has been slow to follow suit (Prensky 2001a, 2001b; Selwyn 2009). Therefore, having resonated from a growing interest in the learning potential of online technologies and practices, Siemens’ “connectivism" has become one of the most prominent of the network learning theories. For Siemens, “connectivism” means to describe how knowledge is distributed across a network of connections. Siemens maintained that a new connected reference was necessary – one that was

more concurrent and future focused, and where the impact of new technologies was illustrated through network forming processes, autonomy and communal approaches (Kerr 2007a, 2007b; Siemens 2004,2005, 2008a, 2008b). Siemens argued that connectivism implies a certain constant state of being connected and not, as constructivism suggests, being constructed. In this way, the notion suggests that we are in a constant state of filtering and sorting, assisted by network ecologies.

Siemens's connectivism has attracted criticism as it appears, on the face of it, to reject all of the traditional beliefs from older forms of culture. One of the most controversial claims is that connectivism should not be considered as a stand-alone learning theory, as it appears to share comprehensive properties with constructivism. The "self- explanation effect" he discussed for example, is closely relatable to the Vygotskian Zone of Proximal Development. As a result, it has been suggested that connectivism is merely a modern strategy for harnessing networking behaviours (Kerr 2007a; Verhagen 2006). Anderson and Dron (2011) also argue that the approach has a poor fit with more formal and traditional contexts, as current education systems are based on constructivist and cognitive-behaviorist models and not, as Siemens suggests, compatible with collaborative learning models. However Siemens disagrees, arguing that connectivism is simply social learning that is networked and thus the term itself is characterised by a reflection on our rapidly changing technological society, where social groups have become more akin in structure to networks.

For Siemens, learning begins with the individual and occurs when knowledge is actuated by learners connecting to and participating within a learning community. Siemens defines these learning communities as “the clustering of similar areas of interest that allows for interaction, sharing, dialoguing and thinking together” (Siemens, 2004,p.2). Therefore, a sense of community and communal responsibility seems fundamental to understanding how the connected learner is constructed and perceived, as strong feelings of community have been considered to increase both the flow of information between learners and their commitment to group goals (Bruffee, 1993; Dede 1996; Wellman,1999). The core value here is that students can locate their learning within a knowledge building community that assumes that one person’s individual knowledge can serve as a resource for other peoples’ learning (Scardamalia and Bereiter, 1991). Ackermann (2004) also emphasised this active approach to learning and knowledge building, pointing to the process that is built upon if we perceive there is an inherent value in constructing understanding and knowledge of the world through experiencing things and reflecting on those experiences in the learning process. I would argue that these arguments all point to a constructivist design albeit within different contexts. However, as Ackermann argued, people’s ideas on what constructivist methodologies are are changing. In particular, there is debate about what effective modelling means in the context of a digital environment. Whereas the traditional view of constructivism puts particular stress the importance of caring and knowledgeable adults on a child’s growing mind and on how the presence of adults with greater expertise can “speed up” and enhance a child’s self-

directed learning, in the theory on connectivism and indeed in Class X, this is not believed to be the case. In fact, the concept of Class X and Siemens' connectivism have a similar theoretical foundation. This can be best illustrated by massive open online courses or (MOOCs), which are considered the main pedagogical method from which the application of connectivism has taken.

As we discussed in 2.2 "Being Human", it has been suggested by educationalists that digital natives, otherwise known as the "homo zappiens", learn differently to past generations of students as they are upheld to be active experiential learners who are proficient in multi-tasking, dependent on communications technologies for accessing information, and dependent on technology for interacting with others (Oblinger & Oblinger, 2005; Prensky, 2001a, 2001b; Tapscott 1999; Vreen and Vrakking 2006). This reliance on technology for communication activities has led some to suggest that there has been change in the normative and basic interactions of young people towards a more textual based communication. This has resulted in calls for an increased use of communication technologies in educational contexts which is based solely on the principle that the needs of a new generation of digital natives demands it – a phenomenon which has been broadly criticised. On one side of the argument, there is the strong inference that schools need to fundamentally change to accommodate the skills and interests of these "digital natives" in order to be relevant and effective places to learn. On the other side of the argument, there is the view that the digital native does not exist and if we increase technology in every social process there will be what Postman (1988:4) termed as a "Faustian

bargain” that means that for every advantage a new technology offers, there is always a corresponding disadvantage. Therefore, there is a good reason to examine the current uses of communication technologies in education, namely massive online open online courses or (MOOCs), which were designed to test the principles of ‘connectivism’ conceptualised by Siemens and Downes (2009).

The term MOOC originated in Canada and was used to describe an open online course at the University of Manitoba designed by George Siemens and Stephen Downes. The first MOOC course itself was conceived to follow Ivan Illich’s injunction that an educational system should “provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want to learn it from them; and, finally furnish all who want to present an issue to the public with the opportunity to make their challenge known” (Illich, 1971, p.75). Therefore, the MOOCs were designed to serve a democratic purpose as much as a connective purpose and were intended to be disruptive, dynamic and continually changing environments afforded by technology.

Connectivist MOOCs (or cMOOCs) distribute their content through networks. The principle here is that this model of learning reflects the current learning climate and environment in which we exist, that is, the world of the “digitally native”. Consequently, the MOOC teaching approach is considered to be construction oriented because students have to have the ability to self-organise. The MOOC is similar in structure to Class X as both claim that given the right

technological context, a more learner centred environment can be created via socially-based group learning scenarios. In addition, both argue that there is no need for a teacher's physical presence. Rather, the role of the teacher is one of facilitator, or "minimally invasive" akin to Mitra's SOLE. This view supports some of the rhetoric around the "digitally native" discussed in previous sections, as it acknowledges that the practices of people in their everyday lives is crucial to informing effective teaching and learning. Therefore, the next section will examine the application of teaching within cMOOCS as the closet replicable example of online learning to Class X.

Within the cMOOC learning environment, it is indicated that technology serves as an engaging medium for student thought and collaboration. Consequently, the belief that the role of the teacher is conceived differently within a cMOOC is tied directly to the presence of technology. This is a key concept to Siemen's connectivism, which does not see interaction as limited to human beings. This means that within a MOOC, learning may reside in non-human appliances too, such as computers (Siemens, 2004). The implication is that because students have to self-organise within a MOOC, and indeed within Class X, the role of the teacher is different because the technology itself serves as a proxy tutor.

To explore this further, I turned to Bayne and Ross who, in their UK review of the pedagogy of cMOOCS, pointed to only three roles of teachers that facilitate the cMOOC: the distant 'rock star' or 'academic celebrity' lecturer; the co-participant or facilitator within a network; and the automated teacher. I would

argue that all three constructions of teachers point to one key position, namely, that the teacher role within an online learning environment is minimally invasive. This key concept is fundamental to the cMOOC, and it is also important in the context of Class X. Seeley Brown (2000) was indicative of the view that learning which is facilitated by the Internet fosters a “new” kind of discovery based learning. This has been termed, amongst other descriptors, as “bricolage”, networked or experiential learning, and they all relate to a person’s abilities to find something, for example an object or a tool, and critically use it to build something the person using it deems important. This suggests that within discovery based learning, where the emphasis is student-centred, the teacher does not teach or deliver knowledge, but facilitates it. Consequently, there is a strong suggestion that when a technological environment is optimised there is ‘minimal involvement’ from the instructor, or at least, the environment is minimally instructional.

The principle of the minimal involvement teaching position has traditionally been seen to facilitate self-directed learning. This is because teaching is framed as a supporting device for performing learning processes. Therefore, the “academic celebrity” teacher does not communicate with students in any dialogic or interpersonal way, but stands as a guide or mentor. However, despite the inference that technology supports a new relational configuration between teacher and student, there are many opposing views and much opposing research that suggests that technology in and of itself does not directly change teaching or learning at all (McClintock and Taipale 1994; Scardamalia and

Bereiter 1991). Salmon (2000) for example, used a five stage model to understand how students engaged in online classes and described how the teacher becomes an e-moderator who supports student learning through motivation, information change, knowledge construction and development (Salmon 2000). She believed that the teacher's role may be different to that of a traditional classroom but they were, nonetheless, important to the children's learning. Similarly, Swan (2001) found no evidence that having access to the web without instructional guidance was effective, and concludes that "three factors contribute significantly to the success of online courses. These are a clear and consistent course structure, an instructor who interacts frequently and constructively with students, and a valued and dynamic discussion" (Swan 2001, p. 13). Hammond (2016) also believed that "collaboration cannot be guaranteed in a context in which it is promoted" and whilst some learners can work together purposefully this is something that is "invitational" (Hammond 2016, p.1009). Equally, Scardamalia and Bereiter (1991) believed that the proposition that students can construct their own knowledge leads to "dangerously romantic optimism" as student and teacher are seen as engaged in a joint activity, and the critical role of the teacher should not be underestimated as knowledge is "dependent on more rather than less intense involvement of the teacher" (Scardamalia and Bereiter 1991, p.39). The literature thus seems to be in agreement that, although online teaching is different from face-to-face teaching and the teachers' role maybe different, teachers are still necessary to the production of productive dialogue and learning. This also suggests that presence of technology in the classroom does

not equate to a minimal involvement from the teacher and certainly the consequences of such an approach should be met with caution.

However, there are also examples of cMOOC research which contradict this belief. This is because they see the cMOOCS' relevance to contribute to new pedagogies in environments where control is shifting from the tutor to student (Kop & Hill, 2008; Kartensi 2013). Consequently, the cMOOC can be promoted by the "social presence" of facilitators (teachers) rather than a more "hands on" or instructional approach. Adams and Yin (2015), for example, reported that children experience the learning opportunities qualitatively differently to those in a face to face classroom. Consequently they found the presence of the cMOOC instructor as "irrelevant or absent" (Adams and Yin 2015:697). Other studies have found that cMOOC learning communities are promoted by the presence of teacher facilitators. This is because the minimal involvement position within specific cMOOC contexts is frequently framed in terms such as facilitation because the goal of the cMOOC is to facilitate self-directed learning, thus teaching is framed as a supporting device for performing learning. This was illustrated by Kop *et al* (2011) who, in their study of participant support within online environments, found that people who learn on open networks such as MOOCS could self-regulate and organise their learning if they had a high level of self-direction. Consequently, the role of the teacher within a cMOOC is one of curator, facilitator, supporter, coach, or moderator rather than a more instructional presence. This is based upon the idea that networked learning, such as the MOOC environment, is principled around the building of

connections and collaborations between resources and people. They are conceived as “places” where learners might feel comfortable, which refers back to the principle of educating the “digitally native”.

Brown, Collins and Duguid (1989) argued that participants within these new learning environments are abandoning traditional teacher student roles because any person who has an understanding or knowledge regarding a particular subject matter is able to share the role of a mentor. This concept was also a key argument for Brown (2000) who likened this practice of learning to a cognitive apprenticeship between the learner, the internet and the members of the network. In this mindset, the student learns in situ in a notion of distributed intelligence that Brown locates as “the essence of lifelong learning” (Brown, 2000, p.17).

This connects to the principle that although the teacher may be present in the learning process, the actual learning comes from the development of trust and confidence in the learning community and the teacher is just one part of that network. Therefore, from both sides of the argument, there is at least some conjecture that the role of the teacher can be different in an online environment. This refers back to the work of Mitra, whose “Hole in the Wall” experiments sought to drive home the message that, in this age of the internet, knowledge is easily acquired without the presence of a teacher as groups of children can learn almost anything by themselves when given internet access and the ability to work collaboratively. Class X is closely aligned with Mitra’s research, because

it claims to be based upon Mitra's "self-organising learning environment". I will now end the Literature Review by looking more closely into Mitra's argument and in particular examine where the principle of "minimally invasive" teaching originated from.

Mitra believed that our desire to be connected to the online social world is merely a representation of the natural development of our co-evolution with machines. This is because Mitra believes that children are intrinsically digital. As a result Mitra perpetuates Prensky's concept of the "digitally native". Mitra's interest in what he termed, "Minimally Invasive Education" came when he observed children of wealthy parents teach themselves new skills on the computers with very little assistance from teachers. Believing that the same learning techniques could be applied to the poor, he came up with the idea of the "Hole in the Wall" experiments. Placing a computer in the slums of India, the experiment was designed to test one of the "digitally native" proposals, namely, that all children have the skills to use computer without the instruction of an adult because they are intrinsically digital. After one day of the computer arriving, the children were observed to be using the internet, despite not knowing what a computer or the internet were. Mitra believed this was evidential proof that children are digitally literate because they can use the tools of technology without instruction from an adult. Thus, Mitra's initial theory of minimally invasive learning was based on two underpinning principles. The first, that children need to be allowed to learn within technological networks and, the

second, that they do not need a teacher presence to learn effectively if they have the tools of technology.

Although Mitra has more recently distanced himself from his original theory, he still locates that the teacher's role should be reconsidered as more of a "minimally invasive" presence in the classroom. Therefore his theories place a strong emphasis on the role of technology, student autonomy and collaboration, and less importance on the presence of the teacher. Mitra claims that the SOLE concept always works if technology and autonomy are present. Consequently, there are parallels between Mitra's research and the findings of both Kop *et al* (2011) and Adams and Yin (2015), as discussed in the previous section.

However, there is strong opposition for the idea that the teacher's role within online environments is vastly different to that of instructional environments. Scardamalia and Berieter (1991) were indicative of this view, believing that making empirical claims about the abilities of children or the dispensability of teaching is "dangerously optimistic" (1991, p.37). This echoes the idea that simply giving students the tools of technology will not create effective collaboration and thus there is tension between the theoretical claims being made in the literature, and what the empirical research into practice is suggesting. However these responses perhaps fail to address nuances of the Mitra's position, for he believes that technology is pervasive and simply a commodity for both the individual and for society as whole to use to their advantage. From one perspective, the minimally invasive teaching theory

seems to be strongly principled around human connection. Therefore, it is not a complete departure from social-constructivist pedagogy that underlies the importance of learning as a social process. However, it does disrupt the notion that learning should be controlled by educators and educational institutions, as information and “knowledgeable others” are readily available on online networks.

2.5 Conclusion to the Literature Review

To summarise, this Literature Review has explored four underpinning principles that have potential significance to this case study. The first is that being part of and connected to social groups is a fundamental part of human life, because we are “hard-wired” to be social. The second is that the relationship between humans and technology should be understood phenomenologically, because it requires a critical, reflective examination of the nature of technology as well as the effects and transformation of technologies upon human knowledge, activities, societies and environments. The third is that there is a distinct category of learners who are fundamentally different from previous generations of students because they were born in the age of digital media. Termed as the “digital natives”, “net generation” and the “homo zappiens”, these learners are assumed to have sophisticated technical digital skills and learning preferences, thinking, acting and learning with different technologies, particularly online environments. There is a suggestion, following this, that if these learners are placed within certain technological situations, particular forms of interaction are

expected to occur. This is because technology is seen as a source for collaborative activities and dialogue and because technology accommodates the learning preferences of the “digital natives”. Finally, the fourth principle implies that social connectivity, which has been propelled by the ever−increasing use of the internet, will inevitably impact on education, learning and teaching. This is because the concept of the “digital native” is still a major issue for education and there remains a strong inference that education must fundamentally change to accommodate digital natives’ interests, talents and preferences. This change, ultimately, involves the increased use of technologies. All these debates and theories have a bearing upon Class X. I shall now turn to outline the approach I will take in this project to studying it.

Chapter 3: Methodology

3.1 Rationale for a Case Study Method

The design of a self-organised learning environment is considered to represent a learner-centred approach, where students are encouraged to construct, reconstruct and exchange knowledge through collaborative and inquiry based learning. Routed in social constructivism, the SOLE concept is principled around giving students more control over their learning which is broadly aligned with developing independent and autonomous learners and involves the situations, skills and capacity in directing one's own learning (Benson and Voller, 1997). This stems from the idea that placing a higher emphasis on the social aspects of learning in schools, especially on how to access, structure and communicate information through the medium of technology, will make an educational program become more relevant in terms of the "knowledge society". Consequently, technology is viewed as being capable of enhancing learning in particular ways and new learning approaches such as the SOLE are developing ways to use technology as an educational tool to guide the whole learning delivery process itself. The educational argument for the SOLE is therefore centred around the proposal that there needs to be a digital solution to an aged old problem, namely, how to make education more relevant for the "digital natives", not only in terms of the "knowledge society", but also in the

development of ‘critical digital literacies as a basic educational entitlement” (Buckingham 2007, p.144).

Class X believes they have found the solution by creating a learning experience which appeals to the “digitally literate” because it supports forms of socially augmented learning that it is ideally situated to approximate the conditions for “authentic” learner participation. Therefore, Class X places a central emphasis on online learning because it believes that “digital natives” learn more effectively with technology. Additionally, Class X claims that by developing these communities of self organised learners, students will develop a higher than average ability to learn with independence. Consequently, as a result of increasing the autonomous behaviours of the students through technology, the role of the teacher will become peripheral and “minimally invasive” (Mitra, 2001).

To some extent, the belief that self-organisation and instruction are not mutually beneficial has been contested before. Harri-Augstein and Thomas (1991) believed that the self-organised learner is the epitome of learning, possessing self-motivation, reflection, engagement and commitment; thus they argued that applying instructional techniques within learning environments such as Class X can actually create dependency or negatively valued learning, because self-organised learning cannot be achieved through instruction. This is because instruction can only achieve successful submission to the process of being

instructed which supports the view that the teacher's place is more distant party than instructional force (Harri-Augstein & Thomas 1991).

Class X is one manifestation of the self-organised learning principle that claims that learning can exist anywhere where there is a computer, internet connection, and where students who are ready to learn. Yet many different versions of this concept have emerged, despite being based on the same educational principle. For instance, there are examples of SOLE projects which are based within home schooling environments and others within Montessori schools. However, the majority would be best described as blended or flipped classroom learning environments, where technology is used as a modest support to an existing institutional structure rather than a de-schooled form of education which rejects the role of the teacher completely (Selwyn, 2009).

Class X therefore has potential significance on both an organisational and instructional level, and represents an interesting model to analyse as it adopts a different way of looking at online education. In the context of Canada, increasing students' access to technological models of learning have been identified as an emerging area from which there is a clear need for further research (Barbour and LaBonte 2015). This has also been well illustrated by recent surveys of Canadian public school students. As the link between technology and popular youth culture is well established, there is a conjecture that combining technology with a classroom context has the potential to create a learning environment which both broadly appeals to the 'digitally native" and satisfies a 21st Century skill set. Consequently the rationale to study such a

project has potential significance because it adds to the growing number of research articles which examine the key assumptions about the “digital native”.

3.2 Comparing the Incomparable

As learning strategies which encompass the informal social spaces of the web continue to grow in popularity, it makes sense for educators to consider how we should be responding to this change by analysing how different strategies might work in practice, as we seek to understand how learning might occur in the digitally saturated and connected world we live in. I would argue that this area of growth is particularly relevant in Canada, partly because of the country’s long history with technology in educational contexts and partly because they offer a logistic solution in the context of Canada’s geographical expanse and severe winter weather. More recently the country has seen a renewed interest in the potential of online learning with young children, where the principle of massive open online courses or “cMOOCs” have been used to complement the existing school system. However, a “cMOOC” is an online learning model which is accessed remotely and does not require the student’s physical attendance in a classroom and Class X is an online learning model that is practised within a traditional classroom. So whilst there are similarities between the MOOC and Class X, which were discussed in the literature review, they are only comparable in type through their use of Computer Mediated Communication (CMC) and the minimally invasive role of the teacher which is common to both.

For the purposes of this thesis, I am interested in exploring what influence CMC has on the role of the teacher within Class X, particularly as this “minimally invasive” position is highly contested. I propose to use a case-study approach in order to explore the way the teachers’ role is characterised, understood and experienced in Class X.

3.3 Design

This research aims to capture the complexity of a single case by engaging within a holistic framework. I considered that this research would be best facilitated by using a case study approach for a number of reasons. For one, because it is an in depth study of a single unit and because I had an intrinsic interest in this particular case. Yin (1984) defines the case study as a unique way of observing any natural phenomenon which exists in a set of data. Thus in their true essence, case study research has a predominant interest in exploring and investigating contemporary real-life. Although there are considered to be several categories of case study (Yin 1984; Stake 1995), there are two popular case study approaches which concern qualitative research. The first, proposed by Stake (1995) and Merriam (1988) is situated within a social constructivist paradigm. Here the world of lived reality that constitutes the object of investigation are thought to be constructed by social actors. The second conception approaches case study from an anti-positivist viewpoint (Yin 2012), where the phenomenon is considered to be broad and complex and when a holistic, in-depth investigation is needed, as the phenomenon cannot be studied

outside the context in which it occurs (Yin 1994). In the context of this research, I am orientated towards the first, proposed by Stake (1995) and Merriam (1988), which shares that the goal of understanding the world of lived experience from the viewpoint of those who live it. Therefore, the objective of the social constructivist approach is primarily to steer and suggest the readers in the "general direction of where instances of a particular kind of inquiry can be found" rather than providing descriptions of what can be equivocally known or can be seen (Schwandt, 1998, p.221). Consequently, this research proceeds on the basis that the researchers identity and values will play a role in the production and analysis of the data as the aim is to try to set the scene for the reader in order to create a sense of what Class X is. Therefore, there was a conscious decision to deliberately pursue the "particular", the "descriptive" and the "heuristic" to provide a full picture of Class X and to enable the title of the research to be placed within an educational context (Merriam, 2009).

Stake (1995) believed that it should be the researcher's highest endeavour to enter the case study approach first and foremost with a sincere interest to learn. As such, the interest to study one particular case, rather than a selection of cases, is most often born from curiosity, particularly because they are unusual cases and sometimes, because they can potentially illustrate other matters often overlooked in typical cases. In the case of Class X this was certainly true, because I could not find any replicable examples of the particular pedagogical practices being used. As such, it appeared to be worthy of a predominantly qualitative approach as it explored a real life, contemporary bounded system.

The boundaries between the case and its context at this point should be made clear. We are looking at one group of interviews (n=3) from the teaching faculty of Class X and three sets of discussions which covered three topics that form part of the teaching scheme of Class X. Therefore, the specific instance that is “the case” is justified as representing one instance among others. This is because case studies emphasise a detailed contextual analysis of a limited number of events and their relationships, and thus the case study is a coherent and integrated system in its own right because it is commonly asserted to focus on enquiry around an instance. Case studies treat each case as empirically distinct and do not automatically presume that different instances can be thrown together to support any kind of generalisation from the specifics of a single case. The rationale for using a single case here is that it explores the case in its usual context, because the case is embedded in its natural context in ways that it influence it’s characteristics.

However, there are particular disadvantages that need to be acknowledged with using a single case study, particularly because case study is by nature idiographic work and tends to be interpretive. There is an implication, for example, that the single case study demands something quite different of the researcher when compared to multiple case studies. In seeking the thick description most associated with the single case, the researcher develops an extensive and intimate engagement with the case in order to collect detailed information. This is often justified in terms of the complexity of a phenomenon

and, because the case is unique, it needs to be studied individually rather than treated collectively to find typical properties. This has led many to doubt the validity and reliability of such studies. This is indicative of the methodological trade off with case study research. On the one hand, multiple case evidence is more compelling in terms of its analytical benefits, but it usually does not present the same breadth and richness of single unit analysis. On the other hand, however, the single case can reveal insights about normal processes and thus mark the beginning of a multiple-case study. However, it still suffers the demands of generalisability, based upon the “reasonableness and the plausibility of the case” (Hartas 2010, p.161).

As the case study approach emphasises the role of the researcher’s self, it creates a “lens of subjectivity” that is thought to inform and mediate each element of the research. Certainly, a consideration of self as a researcher is a precondition for coping with bias. For some, this involves a deliberate effort at voicing their prejudices and assumptions so that they can be considered openly and challenged. For others, it is an introspective process. It is clear that the researcher maybe unavoidably intertwined with the research and therefore cannot stand apart from it. Consequently it is the researcher’s job to balance their subjective gaze with an awareness of the relational and reflective nature of the task at hand. Nonetheless, the identity, values and beliefs are often regarded as a limitation, particularly in the single case design. This is because they fall short in their representativeness that is described as the degree in which causal relationships can be evidenced. Additionally, the traditional stance

of the objective outsider is frequently favoured by social scientists, and the most commonly used research procedures that take participant perspectives into account are frequently deemed as inadequate for gathering information. Generally, researchers try to find strategies that minimise the role of subjectivity. However, one could argue that interpretive reasoning can actually enhance the research process, particularly when the research strategy acknowledges the connectedness between the researcher and the participants and when the researcher values a more descriptive inference (Gerring, 2004). This was summarised by Bruyn (1966) as a representation of the different belief systems between the traditional empiricist and participant observers. The empiricists consider themselves to be the primary source of knowledge, trusting their own senses and logic more than trusting that of his subjects, while the participant observers consider the interpretations of his subjects to have primary importance.

So, whilst some researchers have not yet determined how to use the subjective nature of research in a way that provides for an expanded understanding of the process, it is arguable that the image of the value free and objective researcher has been replaced by one that acknowledges the active participation of research outcomes. Qualitative research itself is broadly regarded as an interconnected and mutually influential series of dialogic processes and one could argue that it is somewhat naive to conduct this type of research without accepting and acknowledging our reflective relationship with the data. As researchers, we should not be trying to convince people we are capable of

neutral and value free research. Rather, we should try to cultivate the skill of suspending our preconceptions. Nevertheless, in the context of Class X, which came to fruition from an honest passion and interest in educational innovation, this simply would not be credible as it is situated in the environment of the researcher's discipline and working background.

With this in mind, I moved more in the direction of proactivity by committing to the process of reflexivity and critical reflection which concerns a thoughtful and analytical self-awareness of a researcher's experiences, and how they impact throughout the research process. This demonstrates something important about the commitment and detachment research demands of researchers. There needs to be a willingness to look at oneself and the way one influences the quality of data. There also needs to be a commitment to integrity, whilst remaining open-minded and alert. This is because the mark of good research is to question how we understand ourselves beyond our personal experience. This requires a nuanced awareness of where we are standing, metaphorically speaking. So, in order to be "reflexive" we have to know where we are looking from before we can know what we are looking at, which requires both inward-directed reflection and analysis. However, what we view as reflective practice is neither neutral nor complete, as we are influenced to a greater extent by diverse perspectives and then reflexively incorporate these into our own research practice. Therefore, it is important to remember that engaging within a reflexive process will always be somewhat limited. No research is perfect.

3.4 The “Borrower” Researcher

The case study design is frequently defined by an interest in individual cases rather than the methods of inquiry used. Therefore, in keeping with the “naturalistic tradition” which shares the belief that in order to understand the world one must interpret it, the process of considering this particular case began 2 years ago, with a careful and in-depth consideration of the nature of Class X (in this instance the physical setting, other institutional factors and participant identity). This was considered to be particularly important as the design asked for an ethnographic commitment from the researcher and sensitivity to the meanings that behaviour, actions and contexts have in the eyes of the participants. Therefore the data collection techniques are more “eclectic” than restricted, as the relationship between the researcher and the participants was central (Punch 2014,p.128). Consequently, there was some “borrowing” of ethnographic techniques, distinctly different to ethnography itself, which was used in order to attribute a theory of collective behaviour to members of a particular group. As such the research design did not seek or intend to employ cultural interpretation;. Rather it was an attempt to link descriptive research to short term efforts through a “way of looking” which is more akin to ethnographic endeavours, albeit without the pure or complete description gained from the time honoured traditions of fieldwork. It it is merely a nod in an ethnographic direction.

3.5 “Studying Up”

The research design is intended to take an interpretative approach that both supports a transactional method of inquiry and is relevant where the researcher has a personal interaction with the case. This approach is considered to be developed from a relationship between the researcher and the participants, and the idea of this personal connection appeared to be particularly congruent with this research. In the initial stages, there were three preparatory visits arranged with the setting over a period of 9 months and following this a pilot study was conducted. This meant there was an element of “buying in” from the participants to the research design itself (Hitchcock and Hughes 1998:320). This is discussed in “The Pilot Study” section later in this chapter. As was discussed in the previous section, the relationship between the researcher and the researched is particularly important in this case study and this is consistent with the qualitative tradition and markedly different to that of a quantitative researcher. It stems from the ability of the researcher to make him/herself a sensitive research instrument by transcending his/her own perspectives and becoming acquainted with the perspectives of those he/she is studying. For example, in the ideal quantitative study, participants act independently of the researcher therefore the study should yield similar results if the same conditions were to be applied. However, in qualitative studies the data is considered to be mediated by a human instrument. This is quite a contrast to the positivist paradigm, which holds true that the world is capable of objective interpretation

as natural science is treated as the primary model for rational inquiry and the value-neutrality principle is retained.

This brings us to question how an interpretivist approach for a single case can be convincing and credible. For pragmatists such as Johh Dewey, the solution is to adopt a practical, utilitarian function to knowledge, by accepting the value of interpretivist approaches to meaning-making. Knowledge and ideas are seen as artefacts or activities that function as a platform for action and organisation of human behavior, and this underlines the importance of the social sphere in the ontology of an artefact. Pragmatism holds that knowledge is provisional: what we believe to be true today may not be what we believe to be true tomorrow. Thus knowledge can be based on the subjective perception of the world and one's place in it and the quest for truth is “a hopeless cause” (Denscombe 1998:158). As such, knowledge is thought to exist in the individual's mind, and this is characterised by the individual's justifiable belief that it is true. Hence knowledge can be empirical and non-empirical, tacit or explicit: we often know more than we can tell. As inquiry such as this does not offer guaranteed knowledge, but rather a “sufficient knowledge” that is explicitly articulated through the structures of meaning embedded in lived experiences of the participants (Hartas, 2010:41; Van Manen, 1995).

Without doubt, the researcher’s relationship with the data and their influence upon it has been a recurrent concern in methodology literature. Nader (1969; 1972) believed identifying researcher positionality is particularly pertinent to

qualitative studies and therefore in order to establish a partnership between the parties, she drew the distinction between “studying up” as opposed to “studying down”. Nader believed that the researcher who “studies up” may experience themselves as moving into a research field of less “control” or “power,” which can serve to create more transparency in the way the evidence is ultimately presented. This emphasises the belief that knowledge construction can extend beyond the manifestations based on scientific and objective knowledge, and challenges the value-free objectivity of educational research in favour of a more “value-conscious” approach (Abraham, 1996).

This is consistent with the view of Hammersley (1995) who believed the ‘principle of value-freedom is compatible with the selection of research problems on value grounds, with researchers being passionately committed (as citizens) to particular values, and with them making policy recommendations on the basis of declared ultimate values’ (Hammersley 1995, p.243). Hammersley and Abraham both believed that social research should be committed to truth and accuracy, and that that itself is a value. This suggests that whilst social research seeks a different notion of truth, it has been influenced by elements of positivistic thinking. On this point then, social researchers are considered to test the validity of their hypotheses from realist accounts of truth in contrast to the logical positivist approach where the truth of theories is thought to only be abstracted from specific “political” or “ultimate” values (Abraham 1996,p.83). Consequently, it appears that whilst social researchers cannot satisfy the empirical description of truth, they can defend their research by virtue that many

disdain the ideas of truth and objectivity in the social sciences altogether, preferring instead the notion of multiple discourses of knowledge. Therefore one could argue that they do not aspire towards objectivity as social phenomena is not objective in the first place. The crux of the problem is that whilst it is easy to try to label potential sources of bias in order to arrive at sound and credible explanations of the social phenomena, it is neither possible to construct rules for judging the validity of particular studies or domains of inquiry, nor is it possible to specify procedures that, if followed, will systematically eliminate bias and error. We therefore need to think of the social processes that might keep research honest and fair and enhance its quality. Thus, we have established the central problems in social science research arise in two general areas, the first being issues concerning the discovery and evaluation of matters of fact and the second concerning the inferences that social researchers draw from a given range of empirical data.

3.6 “Verstehen”

It is difficult to formulate an argument which suggests this research is anything but subjective on the basis that objectivity is synonymous with detachment. As I have gone to great lengths to demonstrate, this case study was born from curiosity and a conscious commitment was made to try to understand the social phenomena at hand through the participant’s eyes. Consequently, the relationship between the researcher and the participants cannot be ignored. However, in the case of a single case study whose methods are dominantly

qualitative, it is important to address the issue of bias by asking two critical questions. Firstly, the influence of researcher identity and, secondly, researcher position in relation to the topic of research. This involves a deliberate effort to voice one's prejudices and assumptions so that they can be considered openly and challenged and therefore it is seen that the task at hand is more an exercise of seeing what frames the researcher's interpretations of the world as opposed to attempting to convince the reader that you are beyond bias.

In both philosophical and scientific terms, the principle of taking the individual's subjective meanings as the starting point of social enquiry is located between the dichotomy of "verstehen" and "Erklären". These are closely linked to the aim of securing an epistemological basis, for the distinction between the natural and the human sciences, which is central to the work of Weber (1986). Weber's aim was to try to achieve and understand why humans behave the way they do, because he saw that placing yourself in historical contexts to seek out an understanding of the world through the eyes of the person who lived at the time, was useful. Weber (1968) believed that this principle of "verstehen" could be applied to qualitative research methods where there is "a kind of empathetic liaison with the actor on the part of the observer" (Parkin, 1982, p.19). Interestingly, Weber's approach did not view "verstehen" as merely a consideration of how one person's account of another person's experience could be considered a sound way to comprehend social action. He saw it as a method in itself, because we do not need to be physically present in a certain social situation to understand it and we can reach a type of comprehension

about that social situation through a recourse of explanatory understanding. It is through “verstehen” that we try to grasp the motives and subjective meanings of various participants in various social situations. Therefore “verstehen” emerges from an instrumental and objectifying relation to the world that can be achieved to all extents and purposes through the behaviour of the researcher. One could therefore argue that all researchers come to research from one position or another and the “lens of the researcher” will always be involved to a greater or lesser degree in the analysis, the interpretation and in the representation of the data (Punch and Oancea 2014,p.50). Therefore from this perspective, the design has addressed the apparent strengths and weaknesses of the research and has taken into account through a thorough planning process how the methods can take advantage of researcher positionality as much as possible.

In a fundamental way it is impossible to know to what degree address the issue of bias in this research was accomplished. However, what should be clear is that there was a conscious choice to “study up” rather than “study down”, which involves a process where a researcher moves into a position of less control or power in order to facility the relationship with the participants. To illustrate one of the substantial advantages of this approach, Goodwin, Pope, Mort, and Smith (2003) wrote, “the community being researched is not a passive component; it also has a bearing on what the researcher is included in and excluded from”(Goodwin, Pope, Mort, and Smith 2003, p.576). Furthermore, Karnieli-Miller *et al* (2009) explain that “to gain access to the participants’ private and intimate experiences, the researcher must enhance a sense of rapport with

people and needs to build a considerate and sympathetic relationship and sense of mutual trust" (p. 282). Both Goodwin, Pope, Mort, and Smith (2003) and Karnieli-Miller *et al* (2009) argued that this can be best achieved in the use of more ethnographic techniques, which work well in case study designs where the aim is to describe a case descriptively (Stake 1995, Merriam 1988). Furthermore, this case is seeking is to generate a sense of openness by gaining access to the participants' private experiences. The focus is not upon delivering a definitive answer to the research question, but to understand the particulars of a single case, how it is experienced, and how it is perceived by the participants themselves. Therefore it is positioned within the traditions of ethnography by virtue of relationship to the subjects and to the subject matter. Consequently, in order to defend the general principle of conducting a single case study that is mainly qualitatively analysed there should be a commitment from the researcher to recognise where their biases and values might lie in order to provide a faithful account of what has been written. This requires a great deal of introspection, as the researcher must describe to the reader any relevant aspects of their role within the data, including any assumptions, expectations and experiences. So in essence, we are seeking an overarching sense of openness by using what Cohen *et al* (2011) referred to as "the principle of fitness for purpose", where the researcher makes clear the type of analysis they want to do as this determines the kind of analysis which is undertaken (Cohen *et al* 2011:538). With this mindset, a relationship can be established with the determination to "minimise the distance and separateness of researcher-participant relationships", and on the basis of this shift in power

relations between the parties the awareness of the co-construction of knowledge can become more or less acute. The positionally of the researcher is therefore very important because in the context of this case study “when there is a greater asymmetry between the researcher and the researched” this is a more sensitive issue (Hammond and Wellington 2016:118).

The attraction of tackling these issues from the outset is not to hide behind the issues as if they are not there – for the case study is an exercise of depth that provides a unique opportunity to see what others have not seen by engaging within the best of our interpretive powers. Social research, in this sense, should not be judged on how neatly it fits within the positivist paradigm, but rather requires a deliberate focus upon the individuals and the responses in a particular social situation. Taking into account the title of this research, which is based upon the complex and real world of teaching and education, one must accept that it is an exercise of interactive communication. Thus it has a distinctive focus for attention, and decisions about which methods to use should be based upon how useful the methods are for addressing the question at hand as no one can achieve absolute representations of reality. As Stake (1995) reiterated, realities cannot be ignored but should always be weighed.

3.7 The Explicative or the Experimental?

From this perspective, then, the case study should refer to a “case” as the object of study. By creating a specific focus, but simultaneously taking account

of the context and encompassing many variables and qualities, the strategy is “explicative” or “experimental” as it contains one unit of analysis and a few isolated variables in qualitative research (Johansson, 2002). It is arguable, given the ethnographic techniques which have been applied to this research and the fact that the case represents a very selective sample, that it resembles a quasi-experimental design and, as such, does present particular challenges about the external validity and generalisability of the findings. However, I would argue that whilst there are certain elements of the experimental or explicative approach that fit within the methodology, there are many that do not. For example, there is no application of pre-test or set measures to analyse variance. It is also not the intention to implicitly compare one set of data with another, which one could argue is a plausible approach if the data collected from the pilot study could be used as a dependent variable. However, the way data is analysed should always be driven by the research questions. As has been argued, there was a conscious choice to allow the experiences and the perceptions of the teachers to speak for themselves in “an intersubjective study”, and thus there is a form of dialetic relation between the researcher and the phenomenon itself (Van Manen, 1995:11). Therefore, to use either of the terms, “experimental” or “explicative” when referring to the case study approach is only appropriate as they both convey a description of a single case which represents a new and innovative style of teaching, rather than comparing the like with the like within a particular research design strategy.

3.8 In Search of the "Particular and the Peculiar"

So, whilst this single case is analogous to a single experiment in as much as it satisfies some of the conditions to be defined as such, it is not explicitly an experiment. The underlying approach focuses on the multi layered nature of meaning through personal interpretation of the data. From the outset, when the title of this research was being considered, there was a motivation to seek out the particular and the peculiar, as this was the attraction of doing the research in the first place. Class X stood out mainly because the Class seeks to explore the potential of extending online collaborative dialogue. In essence, Class X expects their students to communicate online to complete tasks when they are situated in a face to face setting.

Essentially then Class X has to be considered as a concentrated, single inquiry. Consequently the notion of reporting "data" in the context of this research is ambiguous as, when the world of lived experience is the source and object of the research, it is more often than not associated with subjective information because it does not contain the "hard data" more associated with positivism. Certainly the title of this research and the characteristics of Class X do not lend themselves easily to the positivist approach. As Miles and Huberman (1994) argued the boundary of the case study is often indeterminate.

Equally, where the case represents an extreme example which deviates from theoretical norms or everyday occurrences, the value of the study is more

connected to the wider scope of possibilities that are well beyond the small sample from the original research. Thinking here back to the Literature Reivew, Mitra originally claimed in his “Hole in the Wall Research” that a self-organised classroom environment offers a good and replaceable example of an alternative instructional environment as it produces predictable outcomes at low cost. Therefore, this potentially provides the “insight about normal processes” Yin referred to, which serves to provide a valid rationale for selecting a single case (Yin 2014:52). However, using a single case design exposes this design as potentially vulnerable, particularly with regard to reliability and validity, and for this reason it is important at this stage to take both of these concepts of research measurements in turn, in order to minimise these concerns for this particular research situation.

As we have discussed, the starting point is often born from a prevailing interest in the subject of enquiry and from this curiosity a process of deliberation occurs, where the researcher must decide how to narrow the field of focus. For myself, this was possibly the question I considered everyone would ask of this particular case, because the idea of the teacher’s role becoming peripheral is so contested. Consequently, to be involved in a study such as this, where the prevailing interest is upon the lived experience of teaching children in an online environment, I needed to firstly question, what is the meaning of teaching, as nothing we consider to be true about “teaching” should be taken for granted; only that the meaning of teaching needs to be found in the experience of teaching which is obtained through the gathering of lived-experience material

from different sources. This is useful to remember as, when the intrinsic interest of the research design is to explicate and study the lived meanings of the participants by effectively pulling the data apart and putting it back together in a more meaningful way, the resulting “data” is in intersubjective study of its subject matter. Therefore what should be very clear is that the notion of “data” in research of this orientation is ambiguous, presumed unique and not necessarily reproducible. It is intentionally dedicated to studying the perceptions of teaching using the “thick description” most associated with interpretative approaches (Geertz, 1973). It does not seek to provide empirical facts or objective data but rather an accurate but limited understanding of a unique case that is closely bound by virtue that the participants are affected by context and deliberately unique as the case is unusual or extreme, deviating from “theoretical norms or everyday occurrences” (Yin 2014:52).

3.9 The Secretive Researcher or the Transparent Researcher

In the context of Class X, it is critical to remember and acknowledge that the researcher is the primary data collection instrument and, from this perspective, there are certain questions regarding the credibility and validity of this research that should be acknowledged. For example, it is neither possible nor credible for a qualitative researcher to state in any substantive way that their research data can provide evidential proof they “have got it right” in as much as what one person “sees” another may disregard (Lincoln and Guba 1985). Equally, it makes no sense that they have got it “wrong” either, for a case study that uses

qualitative methods cannot be verified in the same way as quantitative research. Certainly, in the instance of the single case study design, the data set tends to be a “one off”, so one could argue that there is little point trying to pursue cross unit analysis when the units in question neither “exhibit variation on the dimensions of theoretical interest and/or the researcher cannot manage to hold either factors constant” (Gerring 2004, p.352). Of course, there is also a tendency with this type of research for the researcher to be intimately involved in the collection of the data, and it is this relationship, where the researcher’s “self” is sometimes an integral part of the research instrument, which serves to place naturalistic generalisations under the undesirable label of “fuzzy” (Bassey, 2001; Lincoln and Guba, 1985; Gerring, 2004, p.341).

There is no purpose in avoiding discussions about the special relationship researchers have with their case studies, in fact, there are many researchers who have sought to draw attention to it and embrace it. Stake (1995) spoke of this at great length, believing that the advantage of case study reporting where the reader knows something of the personal experience the researcher has had of gathering the data minimises misperception and the invalidity of the conclusions. In the same vein, Van Manen (1997) argued that not all research can be rationalised under scientific principles as there should be a level of artistic license which distinguishes qualitative practice and nurtures creativity, innovation, and reflexivity. As notions such as truth, method and understanding are always understood within a rational perspective, she suggests that human science is different and thus it should operate within its own criteria. Whilst, Van

Manen (1997) does distance herself from completely rejecting the notion of rationality in human sciences, she does believe there should be a broadened notion of rationality because rationality itself is located in the belief of the power of thinking and dialogue that is maintained through a thoughtful and conversational relation with the world. Therefore, whilst there is a danger of self "indulgent discourse" in research of this nature there is also a possibility to deepen our understanding of human life, which can be achieved through making reasonable decisions and assumptions based on what we see, what we hear, and what we know (Van Manen 1997:17). Consequently when selecting a case study design we are faced with a trade-off between "celebrating the extent to which the self is intertwined in the research process" and satisfying the hardened critics who view that the position of the researcher should be completely impartial. In practice, I would agree with Denscombe (1998) that there is room for some biographical details about the researcher as part of the analysis in order to make explicit how my personal experiences and values may influence the research. It is not, after all, a secret.

3.10 The "Substantive Dog" wags the "Methodological Tail"

At this point, it is clear that the challenges which surround the notion of the researcher's "self" and the researcher's relationship with the data have become an important issue in social science research. This is because validity and credibility are most often judged on the basis of conventional criteria used for quantitative research which many qualitative researchers believe can be

misguided (Van Manen 1997; Gerring 2004; Stake 1995). However, it does illustrate something important about the structure of descriptive propositions in social science because “the attraction of intensive and interpretative study are ever apparent, even when qualitative study is considered unworthy of respect by many research agencies and faculties” (Stake 1995:46). Therefore it is the issue or interest which should drive the methodological approach and not the other way around. The “substantive dog” should wag the “methodological tail” (Punch and Oancea, p.89 2014). Undoubtedly, it is tempting as a researcher to try to fit the single case within a collective study for the purposes of satisfying external validity. There is also a clear advantage in trying to design methodologies that give our studies more respectability, but often they can be inconsistent and inappropriate to the study design. Therefore, qualitative researchers are often left sitting on the fence and, on the one hand, choosing cases which are representative of the phenomenon under study, and, one the other, choosing cases that represent the most difficult scenario for a given proposition and are thus biased against the attainment of certain results. Invariably researchers face a choice between knowing more about less, or less about more.

3.11 “A Question Well Asked is a Question Half Answered”

What is common to qualitative research is the endeavour to seek a greater understanding which is usually defined by an interest in the case itself rather than the methods of inquiry used. Therefore case studies should be designed to

suit the case and the research questions by using a “pallette of methods” as methodological integrity is more important to qualitative studies (Stake, 1995, pp. xi–xii). Thus the criteria for a well-developed case study design should be more focused upon developing an empirical criteria for research questions, keeping in mind that the Deweyan perspective that a question well asked is a question half answered. Therefore in this tradition, the first two questions, “What do teachers perceive to be opportunities in online collaboration?” and “What do teachers perceive to be difficulties in online collaboration?” were formulated as qualitative inquiries. The third question, “How is participation patterned between teachers and students in online discussions?” sought to more fully understand the role of the teacher within Class X by specifically looking at examples of the online interactions between the members of Class X through a quantitative analysis of the discussion. These three “subquestions” helped to narrow the broader focus of the overarching question, “What is the teacher’s role in promoting online dialogue in a self organised environment?” which points toward one of the theoretical assumptions designed to be examined in this study, namely, that an online learning environment where children are self-organising requires little in the way of guidance from a teacher.

3.12 Introduction to the Methods of Analysis

This research consists of two topics that are closely related to the use of online learning in the classroom. The first concentrates on the use of technology in learning from the teachers’ point of view and how learning in this context is

exemplified in practice. The second focuses on the digital native phenomenon, namely how the appearance of the alleged characteristics of this net generation have contributed to the belief that online learning should be practised more freely in traditional classroom contexts. These topics are examined with three research questions, the first being “What do teachers perceive to be opportunities in online collaboration?”, the second being “What do teachers perceive to be difficulties in online collaboration?” and the third being “How is participation patterned between students and teachers in an online discussion?”. Consequently, this research uses a case study strategy and concentrates on the above mentioned topics.

The title of the research “What is the teacher’s role in promoting online collaborative dialogue in a self organise environment?” presented me with three predominant challenges in designing the methods. Firstly, how to give a broadly interpretivist study more credibility; secondly, how to present the perspectives of the participants in order to maximise the reader encounter with the case; thirdly, how to create a good window for examining the conditions and the complexity of the case. As research methods need to serve the function of the research, I decided to conduct in the first stage interviews with the teaching faculty of Class X (n=3), and, in the second stage, conduct a quantitative analysis of some asynchronous discussions. Therefore, this case study is based on qualitative methods but has a quantitative measurement to guide the analysis of the asynchronous discussion. This has been identified as a key difference between case studies and other methods, as whilst case studies do use quantitative

data, they do not attempt to control the context. Case studies enable a researcher to study contemporary phenomena in a real-life setting, where boundaries between context and phenomenon tend to be blurred (Yin, 1994; Stake, 1995). This was considered by Creswell (2003) to provide more possibilities for confirming findings and providing a deeper insight into the research topic, which not only stresses the importance of the research problem but also finds the right methods that best meets the needs of the research.

3.13 Method of Analysis for the Interviews

The use of collaborative strategies, the age of the participants, and the prevalent use of technology in Class X, compelled me towards using research methods which complemented a qualitative appreciation of these factors, using methods which best portrayed the case comprehensively. The interview was deemed the most appropriate, as the principle uses of case study are to obtain the descriptions and interpretations of others in order to retain the individuality of the case (Hitchcock and Hughes 1989, p.321-322). As the overall nature of the research had an ethnographical context, the interview was designed to be semi-structured in the sense that the questions are open, and can allow ideas to be brought up during the interview as a result of what the participant says. Furthermore, because there had been a considerable investment in the familiarisation with the biographical and contextual features of not only Class X but in education innovation as a whole by the researcher, the interviews were conducted from “mutual interest” in the topic (Kvale 1996:14). Inevitably then,

this semi-structured design would be classified as informal which critics would argue is an unreliable method of data generation, given the interviewer is a co-producer of knowledge in as much as they bring “their own, experiential and biographical baggage with them” (Cohen et al 2000,p.121).

Although this cannot be denied, it could be argued that in order to try to understand the ways people do and see things one must find a means of exploring or gathering data that complement the development of a broader and richer understanding of human phenomenon. This cannot usually be satisfied with structured interviews. According to Kvale (2008) the research interview is akin to a professional conversation where the interaction between the parties is the base for building knowledge. As this case study asks the “what”, the “why” and the “how”, the questions are of an exploratory nature. Becker (1998) cautioned that this can create defensiveness on the participant’s part if the questions are not considered friendly. From this perspective, using the semi structured design can be defended (Becker 1998). Additionally, Becker elucidates about the concept of imagery which is based on the predetermined images that the researcher brings to his or her research. In essence it means “how the researchers think about what they are going to study before they actually start their research, and how their picture of what that part of the social world is like, and what the work of the social scientists like, get made” (Becker 1998 p. 8). Consequently, he suggested that researchers need to do their best to advance the character of their ordinary lives in order to improve the quality of imagery they produce from the data which brings to attention how the

participants are chosen. For example, Becker contends that certain people are not really important to study at all and, in most cases, researchers have the problem of studying either successful social movements or spectacular failures. He believed that “researchers ought to deliberately look for extreme cases that are most likely to upset their ideas and predictions. They ought to choose them as samples of their study for their reasons and not because other people think they are something special” (p. 95). For this reason, although there is one “key informant” interview within Class X, namely, the creator of Class X, there are two further interviews with teachers who are part of Class X but have not been party to the design or the implementation of it. This, along with the semi structured questioning, is in keeping with Becker’s hypotheses that first and foremost when creating questions one must ask if the data generated will answer the question. So whilst the interview may resemble a conversation there is in some ways no option, particularly as one could argue that the participants have had in some way, been party to their inception.

3.14 The Data Collection Method for the Interviews

The purpose of this study was to examine the perceptions of teachers about their role in promoting online collaborative dialogue in a self-organised learning environment, Class X. Three teachers, who represented the entire cohort of the Class X teaching faculty, were interviewed using a series of semi structured questions. These were decided in advance, but also allowed a fair degree of freedom in what was discussed.

An inductive method was used to focus on the particulars of the descriptive data collected, and the interview data was analysed thematically in two stages. This is common to the transcendental realism approach of Miles and Huberman (1994). The first stage was analysed through direct interpretation using descriptive and interpretative codes that were applied to single sentences and in some instances, single words, in order to represent and capture each interview's primary content and essence. In the second stage, there was an attempt to identify repetitive patterns and consistencies in the initial coding. This involved a process of looking for differences and similarities in the understanding and experiences of the teachers of Class X about their role in promoting online collaborative dialogue. This process of coding continued until the four final categories emerged. Therefore the second stage was a process of managing, highlighting and focusing upon the salient features of the qualitative data, after which point I began comparing them with each other to form tentative conclusions.

3.15 Method of Analysis for the Online Discussions

My second method was a qualitative analysis of an asynchronous discussion which was generated from a quantitative measurement. I chose this method because I wanted to look at the three discussions more closely to question how participation is patterned between the teachers and students and how the

participants connect with each other. My role as a researcher in these discussions was therefore one of covert observer after the fact, with the advantage being that, although I was not present in these discussions in real time, I could be reasonably satisfied that there was no observer effect. My thought process in designing this method was, to firstly separate the conversation into speech acts, which constituted the quantitative measurement, and secondly, qualitatively discuss the data. This is because looking at the types of speech provided another way of looking at the relationship between the students and the teacher. In particular, this allowed me to investigate how influential or peripheral the teacher's roles are in relation to the types of conversations that are occurring. Therefore the method was designed to test one of the underlying principles of Class X: that children, when given access to the tools of technology, can self-organise their learning with minimal intervention from a teacher.

3.16 The Data Collection Method for the Online Discussions

The data collection method of the asynchronous discussions initially began with grouping each message within each of the three discussions into corresponding speech acts, namely, assertive speech acts, commissive speech acts, directive speech acts, declaratory speech acts and expressive speech acts. These speech acts were defined to represent Searle's original paper," a classification of illocutionary acts" and were those Searle considered to be indicative of normal speech, with the exception of commissive speech acts, which Searle did

not define (Searle, 1976). The reason why I chose to use Searle's schema was primarily because I wanted to find a way to handle the informal and loosely grammatical text I expected to see from the message posts, given the age of the students within Class X and the information the teachers of Class X had given to me prior to the research beginning. Furthermore, I was interested in using speech act classification because considering online conversations in terms of speech act classes has been done before in related research semi-supervised speech act recognition in both emails and forums. For instance, this approach is used in Nastri *et al* (2006) and Ravi and Kim (2007), the latter employing a speech act schema to determine roles within online threaded discussions with their own design of speech act categories based on their previous analysis of student interactions in discussion threads. In retrospect, I could have done the same, by firstly conducting some analysis of Class X online discussions for the purpose of creating my own classification scheme. However, this was not going to be possible given the limited access I was given. Therefore, I decided to stay close to Searle's original guidelines for identifying commissive speech acts.

I referred to Austin's taxonomy, where he stated that "the whole point of a commissive is to commit the speaker to a certain course of action" (Austin 1962, p.11). These speech act categories were then arranged into a tabulated form where the percentages of each were shown. In addition, I identified who the author was for each message, my interest being to see as an overall percentage which speech acts belonged to which participant. Therefore, my

intention with this data collection method was to examine how frequent each speech act was as found in the data set and what differences there were in the types of speech acts the teachers used within the discussion as opposed to the students, or indeed if there were any differences at all. The purpose being to present the speech acts in a quantitative form and to then to conduct a qualitative comparison of the themes in order to build up a picture of this conversation and ultimately discuss this data alongside the data from the interview method. Through this use of triangulation strategies, I could compare the results of the analysis of online forums with the interviews.

3.17 Sampling Strategy

Previous case studies to examine the teacher's role within online environments, have, for the most part, centred around the world of MOOCS, and on the way teachers are represented in relation to them. Many of these examples have drawn large numbers of participants, partly as a result of the breadth and diversity of the available data, and partly as an outcome of the diversity and motivations of online learners (Breslow *et al,* 2013). However, there are also examples of purposeful sampling in MOOC research which is seen as a useful technique for the identification and selection of information rich cases, such as Class X (Patton, 2002). This type of sampling involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest. In context of this study this approach is highly relevant.

Taking the interview method first, the participants represented all of the three Class X teaching faculty. Therefore, they were the only possible participants. The second method, the analysis of the online discussions, involved all of the 2017-2018 student cohort of Class X and the three Class X teachers aforementioned, who were also the only group who had any experience with the phenomenon of interest. However, there were several limitations placed upon my access to Class X that impacted on the sample. Firstly, I was to conduct the interviews once and only at the start of the first term, and, secondly that I would only be given access to three online discussions (one from term one and two from term two). I was not allowed any access to the students of Class X and given no access to observe them after the pre-visit stage. Therefore it is important to reiterate that these limitations impacted on the sampling strategy I had originally planned when I first began looking at Class X some two years prior which are detailed below.

3.18 Ethics and Ethical Considerations

The broad principles for this research are fourfold:

a) Research should be based on voluntary informed and educated consent.
b) Personal information should be treated confidentially and participants and the institution anonymised in the most comprehensive way possible.

c) Research participants should be informed of the extent to which anonymity and confidentiality can be assured in publication and dissemination and of the potential re-use of data.
d) The analysis of the research will be truthful and respectful.

The design of this research understood the participants to be “active agents” and therefore applied the universal research principles as part of ethical conduct. Referring in part to BERA Guidelines, the first element to consider was therefore to do no harm. As the participants consisted of both adults and children, there were particular considerations to be made with regard to this. Firstly, from a rights perspective, it was important to recognise that children’s rights have priority over the interests of the researcher (Christensen, 2000:20). Secondly, it was imperative to respect the participant’s rights and dignity. As was discussed during the preparatory visits, and detailed in the Research Approval Form I was required to complete for the school, the intention was not to access sensitive issues as I was primarily interested in the teachers’ perceptions of learning within Class X and not in making any formal judgement on individual learning outcomes. In addition, Class X to a greater extent, was anonymised. Therefore from this perspective, there was unlikely to be any conflict in this regard.

The second principle of ethical conduct I considered, concerned the voluntary informed and educated consent of the participants. As discussed in the previous section, the study itself was completely anonymised. Therefore the consent was

sought with this understanding. Furthermore, the design of the research was extensively discussed with the school which included preliminary conversations with the International Relationship Manager and further interviews with the teachers to discuss the proposals for the research. In addition, a dissertation proposal was provided which detailed the logistics of collecting the data, the issues of how I would achieve informed consent from both sets of participants, and how the research questions would be designed. Using Denscombe's concept of designing written consent in 6 stages, a consent form was then provided which included sections on researcher identity, research information, expectations of the participants, the right to withdraw, confidentiality, use of data and signatures of both participants and researcher (Denscombe, 1998). In addition, there was a simplified version of this consent form that was provided to the children, as gaining consent from children creates its own particular ethical considerations – in particular, how informed consent can be sought from a child given the constricts of their cognitive and language capacities (Christensen, 2000, p.88-90). However, the child consent forms were not given in isolation and were provided alongside a more detailed versions of the consent form, designed for their parents. Thus, I made every effort to ensure informed consent had been given from all parties.

The third principle of ethical conduct discusses the anonymity of the participants with regard to the publication, the dissemination and of the potential re-use of data. As was reiterated in the permissions to research that were granted by the school to myself, I made assurances that the research would be completely

anonymised and would make no reference to the school or the participants with the exception of the province and where it was located. However, one of the biggest concerns remained to be the public accessibility of the data, because ethical concerns are compounded when dealing with sensitive data and vulnerable individuals. However, as I was not dealing with sensitive data, and the study was completely anonymised, it was more difficult to predict the harm that might arise from a participant becoming re-identified through the data. Therefore, from this perspective, it was unlikely that the school or the participants would be identified in any instance that brought me to the final ethical consideration, the analysis of the research.

In the traditions of case study research, particularly one which is orientated towards qualitative methods of analysis, the case and the researcher intact are “presumed unique and not necessarily reproducible for other cases and researchers” (Stake 1995, p.135). This is because qualitative research is guided by the philosophical assumptions of qualitative inquiry that state that, in order to understand a complex phenomenon, you must consider the multiple realities experienced by the participants themselves. Therefore, the orientation of qualitative researchers contrasts sharply with that of quantitative researchers on many dimensions, because their approach to rich sources of data requires creativity for its analysis. This can cause issues where researchers feel pressured to distort and manipulate data because the data doesn’t fit when compared with similar studies. However, whilst atypical cases can sometimes contribute to our understanding of other cases, this research is a single case

study design and can thus represent a critical case of a significant theory, in its own right. Therefore, the rationale for studying Class X is that the value is situated far away from theoretical norms and is an exercise of debt and to give others “the opportunity to see what others have not yet seen” (Stake 1995, p. 136).

3.19. Limitations of the Study

This research project involved the teaching faculty and the entire 2017-2018 student cohort of Class X. The limitations in this study, as I saw it were as follows:

1. Sample size: The sample size for this study was limited due to the amount of students enrolled in Class X and the number of teachers who qualified for the purposefully selected sample.
2. Interview data: The three interviews had to be conducted at the start of the term prior to the discussions. I was not permitted to interview the teachers after I had analysed the online discussions.
3. Access to students: With the exception of the pilot study discussed in the next chapter, I was not permitted to have any discussion with the students of Class X. This was a substantial change from my original plan. This gave me certain limitations and altered my original concept of this EdD and this is the reason why the ethical consent form contains details of a planned focus group. I felt these would have given me more data in terms of the student’s

perceptions and experiences, and a fuller set of data to analyse. However, in the absence of this permission, I had to alter my data collection methods.

4. Online discussions: I was given access to three discussions only, running from Term One and into Term Two, and these discussions were selected by the school where Class X is based. Consequently the sample was limited within a certain time span which did not allow for a more extensive review of the data.
5. Method of analysis: By choosing to analyse the online discussions using an adapted version of Searle's definition of speech acts as a means for reducing the analysis material, the set of content categories are prescribed, rather than having been established prior to the analysis by myself and based on theoretical considerations. Furthermore, using Searle's descriptors for each category creates some warranted debate over how the postings were categorised, particularly as some examples within the postings could potentially fit into two of Searle's speech categories, which would have altered the results.
6. Bias: The methods of analysis relied primarily on subjective interpretation of the data. This creates particular issues in relation to bias, particularly as I had been an evaluator of the 2017-2018 student enrolment process for Class X and was therefore known to both sets of participants. In addition, the method I had chosen to analyse the online discussion relied on my interpretation of Searle's theory.

Chapter 4: Presentation of Findings

4.1 Contextualising the Study

Canadian public education has no integrated national system of education, therefore the provincial governments are responsible for establishing the curriculum for their schools, and each province has its own, ministry-established common curriculum. Therefore, within each province, there are many similarities but also significant differences in the way subjects are delivered to students and how these subjects are assessed. This has been demonstrated in particular, with the incremental rise in the practice of distance, online and blended learning, which is primarily due to the practical need for students to continue with their studies during inclement weather conditions. More recently, the major investment in hardware from the Ministry of Education has resulted in schools being afforded more flexibility to provide online courses, alongside face to face learning. This investment has seen rise to a steady and incremental growth in blended learning practices being made more freely available for Canadian students, which combine the support of classroom learning, with the flexibility of e-learning.

Christensen, Horn and Staker (2013) termed this as a sustaining and disruptive option for schools who are looking to combine the advantages of online learning combined with the benefits of classroom learning. Classifying these blended

learning approaches as “hybrid zone” schools, defined by their blended learning approach to the curriculum, they are considered the best of both worlds in terms of meeting the needs of the mainstream (Christensen, Horn and Staker 2013, p. 2). However, they are still designed around seat time and regulated by a minimum number of instructional hours balanced with a period of time online and, consequently, Class X does not fit with the definition of a hybrid zone school because it claims to teach students entirely through the internet whilst they are physically present in a school. Therefore, Class X is closer to a pure-play online learning model that places the highest value on technology for it’s efficiency, relevancy and appeal to the “digitally natives”. This is why Class X was intriguing to me as a case study in the first instance and the reason why I believed it had merit in terms of pedagogical innovation, because it does not fit with either the sustaining or the disruptive option as suggested by Christensen, Horn and Staker (2013).

4.2 Class X

The Class of 2017 – 2018 who were enrolled in Class X represents 56 out of a total of 1750 students at elementary school in one of the largest provinces in Canada. The 56 students of Class X therefore represented just over 3 percent of the total student cohort for the school year 2017 - 2018. Students within the school itself are aged from 6 years to 14 years old, although the students of Class X represent the upper bracket of 12 to 14 year olds. In order to be considered for Class X, students must apply to the school in a separate

application process, which was designed by the lead teacher of Class X. This process has a minimum academic requirement followed by a practical assessment, after which time a decision is made as to who the successful students will be.

In terms of their location within the school, the Class X students are distributed across two classrooms, which are located in the same building as the rest of the elementary school students. They share many of the same facilities such as the washrooms, gymnasium and playgrounds, however, in terms of the learning strategy they are different, as Class X delivers the provincial curriculum online. Therefore, within the school building, there are the students of Class X, for whom the curriculum content is delivered online, and there are the students who are not enrolled in Class X. However, in order to provide a current context for Class X, it is important at this point to note that previous to the school year 2017 - 2018, Class X was classified as a hybrid-zone model of learning, as it shared the characteristics of a blended learning model discussed by Christensen, Horn and Staker (2013). This change of approach to a learning model that is now solely delivered online was brought about by the introduction of a new curriculum being trialed in another province, which was based upon a concept-based and competency-driven curriculum. This was an interesting prospect for Class X to consider, as students in this new curriculum were being encouraged to take a more active role in their learning through the use of technology, which appealed to the Class X pedagogy. Consequently, after this new curriculum received some recognition for their approach in a neighbouring

province, the decision was made for Class X to restructure. Therefore, Class X became a completely online version of the provisional curriculum.

4.3 A Typical Day in Class X

A typical day for students enrolled in Class X is very similar to the other students who attend the same elementary school. For example, they have the same timetabled learning sessions, physical activity sessions and periods of free time. Therefore the only difference in the structure of the day is the way that the periods of learning time are structured and delivered, with Class X students spending their learning periods situated in a networked classroom and the other students not enrolled in Class X spending their learning periods within a traditional classroom. Within the networked classroom of Class X, each student has their own computer that is positioned with five other students in a circle formation. This has been created to replicate a networked environment. The students can see each other and communicate verbally, but they are not at each other's eye level. So, in order to speak or make eye contact with each other, the students need to move from their workspace, because Class X students are encouraged to communicate online. The structure of the learning periods are based around the idea of the teacher introducing what Class X terms as "a big question" to the group, the idea being that the teachers are careful not to lead the students to an answer or in any way reveal what they should learn. Students are then left to self-organise into groups and begin

exploring the question and, for the most part, it is expected that the teacher should remain invisible.

The main underlying principle of introducing the big question into the classroom is that is aids the process of collaboration, as the concept of the SOLE originated from the idea that children should be working collectively and not individually. However, the Class X students are expected to deliberate about the big question online. Therefore, Class X is a reconfiguration of the original SOLE paradigm because the collaboration is occurring within a shared location.

4.4 The Pre-Visits

A preparatory stage of the research design involved pre visits to the school in October 2016, February and October of 2017 to look more closely at how Class X works, from both a student and from a teacher's perspective. Along with these visits, further correspondence and discussion with the teacher clarified the overarching principles and aims of the program and also shed light on how the 460 applicants to the program in 2017 would be assessed during the "teamwork challenge" by the school in order to create a shortlist of 46 students. The purpose of establishing this rapport with the school and project leader was, firstly, to develop a "credible role" which was important to the process of imparting ownership in the research, as the stakeholders of Class X needed to see how the research may benefit their school and potentially may develop a more enhanced appreciation of their practice (Hitchcock and Hughes 1995, p. 207). Secondly, this served to recognise the "borrowed" ethnographic

techniques discussed previously in section 2.4, “The “borrower” researcher”. Although these visits could considered as “out of sequence” from typical social research (Yin 2002, p. 93), this preparatory stage enabled thorough thought about the outline and format of the methods and data collection, including logistical and practical considerations such as how I would get access to the discussions, how many discussions would I be permitted to analyse and how I would be able to organise the interviews. This was particularly important, given that, at the time, I was still located in the UK and Class X was located in Canada.

4.5 The Process of Application to Class X

The requirement for students to be considered for Class X is that they have a B + average grade in Mathematics and English. In addition, successful candidates to Class X will have a B+ average grade in other core subjects and also be involved within extra curricular activities, such as team sports or community projects. There are no other entry requirements, therefore students with English as an Additional Language or students or with Special Education Needs, for example, would be welcome to apply, as long as they satisfy the minimum academic requirements.

The selection process has a practical assessment that aims to test each applicant’s ability to self-organise, manage their time effectively and to work within cooperatively with others. This stage of the assessment was created by

the lead teacher in Class X's second year of inception and was added to the application process in order to try and eradicate candidates who veer towards individualistic goals, as this was identified as a hinderance to the Class X concept. This practical assessment traditionally takes place every February, some six months before the new term starts and all potential applicants are required to attend. Each student is assessed individually using a set of criteria created by the project leader and shown in Figure One. This assessment is completed by a number of volunteer teachers including the three teachers who are directly involved in Class X. Assessors are required to tick a simple yes or no to each of the questions based on their observations of the student. No prompting to the students is permitted by the assessors that the lead teacher believes ensures a fair process. Places are offered to students some weeks after this assessment and decisions are based on a combination of the results of the teamwork exercise and their academic results. Successful applicants to Class X are only allocated by the lead teacher and there are currently only 46 places available.

Following the preliminary visits, it was agreed with the Class X lead teacher that it was appropriate to have a researcher presence during the selection process in order for him to demonstrate first hand how the team work exercise was assessed. I attended the teamwork exercise in the capacity of both observer and student assessor, and was given some brief guidance in using the team assessment applicant sheet (shown in Figure One). In order to minimise the observer effect, the decision was made by the lead teacher not to inform the

students of my role. Under normal circumstances, I would have to approach my presence in this process with some caution, given that the observer effect could be problematic in terms of an educational study. However, I took the view that it was important to understand how the Class X students were selected in the first instance, therefore excluding myself from participating in this team work exercise would not give me the in depth insight into Class X that I was seeking.

4.6 Figure 1 - Team Assessment Applicant Sheet

Collaboration	**Yes**	**No**
Includes everyone's ideas in the plan / solution to the problem (E.G, not just their own idea) **Be a leader not a bully**		
Practically contributes to the product (steps out of lead role to help complete portion of the task) **Help don't just watch**		

Initiative	**Yes**	**No**
Takes risks by offering ideas (using convincing arguments in a respectful manner and volume)		

Self Regulation	**Yes**	**No**
Actively listens (to peers without interrupting)		

4.7 The Curious Case of the Jenga Bricks and the Balancing Ball

In the first instance, the students were placed into groups and played a video clip that provided them with details about the task. The information provided was based around one question - to build tall structures from a selection of rectangular bricks which could support a tennis ball in the centre without falling. The video made clear that the students' first task was to plan before proceeding to build and the activity had to be done in the correct sequence. Students were required to work in groups of six and the students were given a maximum time of 20 minutes to build their structures. Due to the amount of applicants, there were three "rounds" of students to assess. The observer teachers, including myself, were instructed to complete the Team Assessment Applicant Sheet for each student, as shown in Figure one. Short notes could be added, although most teachers were not able to do this in any detail.

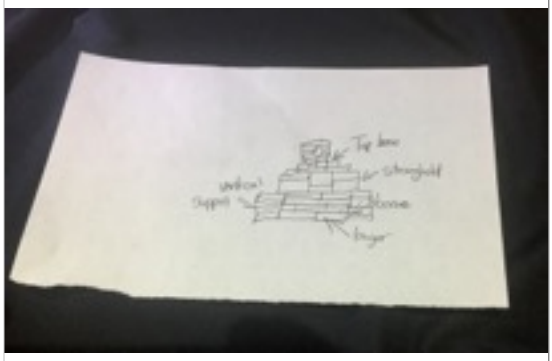
The instructional video made clear that the planning stage was essential, however many students did not make any plans, choosing to go straight to the building stage. In addition many students misinterpreted the instructions given and believed that the challenge was to build the tallest structures in the shortest amount of time, rather than attempting to build many designs. This meant many students made one structure very quickly, usually only using one design and then did not attempt to try to build another. Therefore, many students did not see their plans for the structure built and because there was no prompting

permitted between the observers and the students, they spent the rest of the observational period conversing amongst themselves.

Successful applicants to Class X were noted to be students who followed the instructions in sequence and made plans, some of which are shown in Figure Two. However, students who did plan, but were not vocal enough within the group to ensure their ideas were tested, were not selected either. In addition, students who did not listen to the ideas of their peers were perceived too dominant and were also eliminated. This gave me an initial indication that the teachers of Class X were looking for specific kinds of interactions from the applicants and this suggested that they believed participation was a significant factor to successful collaboration.

4.8 Figure Two – Examples Of The Planning Process From Applicants To Class X

Applicant Planning	Teachers Comments
	Text states - “5 or 6 more stacks on top” “1 stack of blocks at the bottom” “then build a little more at the bottom for more support” Teacher comment - the student demonstrated she had thought through the plan in stages and tried to look at potential ways to improve

Applicant Planning	Teachers Comments
	Teacher comment - the only student to have planned in 3 dimensions. Student described the possibility of using this paper to support the tennis ball as there was no specific instructions not to use ALL the materials on the table (the paper and pen being materials). This was considered to be representative of a student who could adapt and look for novel ways to address challenges.
	Text Reads “ Top Line” “vertical” “support” “base” “layer” “stronghold” Teachers comments - Instructions showed a methodical approach to the task at hand”
	This diagram on the face of it looked simple but on closer examination revealed an early attempt at drawing in 3 dimensions and the student was able to replicate this in the practical element

Applicant Planning	Teachers Comments
	This student both drew and articulated to other team members how they could create the largest design by using a hole structure which she described as “having the most potential to be the highest”.

4.9 Interview Analysis

Looking at the selection process of the applicants to Class X, it was clear that participation and collaboration were considered a significant factor to the teacher’s perceived success of Class X. Therefore, from my perspective, it was important, firstly, to gain the perspectives of the teachers about online collaboration using an interview method and, secondly, to look more closely at examples of some online discussions in order to see how this was exemplified in practice. In what follows, I intend to initially approach the analysis by discussing the data as a whole before looking more closely at the dominant themes that arose from the data.

Looking back at Figure One, it seemed clear that the students of Class X were expected to collaborate. Indeed, students who did not were eliminated from the process. Furthermore, there was a suggestion that cognitive ability was also

considered a considerable advantage to the teachers' perceptions of successful collaboration, as students had to satisfy minimum academic requirements to even apply. Therefore, when I was considering my line of questioning for the interviews, I began thinking about developing an understanding of what the teachers perceived were the key factors to the effective online delivery of Class X. The observations and insights I had gained from the pre-visits suggested that the first line of questioning I should focus on was the characteristics of the students. It was also important to ask how these characteristics linked to successful online collaboration, with a specific focus on how the technology was deemed to facilitate this. Finally, I wanted to refocus the attention on the research title, namely what is the teachers' role in promoting online collaborative dialogue in a SOLE - as Class X is an unconventional model of a SOLE, given it is by all intents and purposes, online learning within a classroom based environment.

In the next section I describe the three teachers' perceptions of Class X to answer the research questions, "**What do teachers see as opportunities in online collaboration?"** and "**What do teachers see as difficulties in online collaboration?**" Included in this discussion are the teachers' views of the students of Class X, how the selection of the candidates is crucial to the success of Class X, the various challenges to the successful implementation of Class X and the teachers' more specific views of how the technology facilitates Class X. I have also discussed the teachers' more general views of the relationship between technology and effective collaboration.

The method of analysis was a qualitative approach of thematic analysis, approached upon the theoretical position of Braun and Clarke (2006) that was discussed within the methodology section. This approach was used to allow the dominant and significant themes that were apparent within the raw data to be summarised, with the intention of drawing out any theory about the underlying structure of Class X and collaboration in general. The data from the interview method is discussed under four key themes of **Student Technological Ability, Student Academic Ability, The Technologies of Class X** and **The Role of the Teacher in Class X.** The most dominant themes were **Student Technological Ability and Student Academic Ability,** which were very closely related. **The Technologies of Class X** were also deemed critical to the teachers' views on effective collaboration, which was particularly interesting particularly as this informed how they viewed **The role of the teacher in Class X.**

For ease of reading each teacher is referred to in the following codes:

LTCX : Lead Teacher Class X

STCX : Senior Teacher Class X

JTCX : Junior Teacher Class X

The analysis chosen for the second method of data collection was presented both qualitatively and quantitatively. Firstly, for the quantitative analysis, each

line of conversation was initially grouped by function into three message categories, messages that involve a request (REQ), messages which provide others with information (INF) and personal messages (PER). These categories were then further analysed into five speech acts: the assertive, the commissive, the directive, the declaratory and the expressive. Each of the three discussions were then grouped by frequency of every speech act. The principle was to highlight patterns in the conversation, namely, what type of speech was occurring between the participants. I then applied a thematic approach to describe the conversation in order to allow for the visualisation of the theme frequencies found in the quantitative analysis. The goal of using this method of data collection was twofold. Firstly, to classify speech acts and, secondly, to compare the thematic data qualitatively. This created a better understanding of the relationship between the participants that was critical to answering the research question, "**How is participation patterned between students and teachers in an online discussion?**" The dominant category that received the most frequent responses was the directive function, which was generated from the teachers of Class X. The second category that captured the most responses was the assertive function, which was entirely made up from the teachers' communications to the students. The third category was the expressive function that was almost entirely the student's responses to each other. The fourth category was the commissive, which was less frequent, but generated entirely by the teachers. There was no evidence of the declaratory function from either teachers or students from the three asynchronous discussions I had access to.

In summary, the investigation of both the interview data and the asynchronous discussions were analysed using two perspectives: the first, from a data-driven perspective and the second, from a research question perspective, in order to check if the data was consistent with the research questions and provided sufficient information. The results are separated by the two chosen methods, firstly, the interviews and, secondly, the analysis of the asynchronous discussion.

4.10 Key Theme One - Student Technological Ability

The teachers believed collaboration was more effective when students had a certain skill set and mindset towards technology. There was a strong sense from the interviews that all three of the teachers believed that building upon students existing technological skills should be a critical educational goal. Additionally, they believed that Class X students should possess some existing technological skill sets, which was interesting as this was not part of the selection process discussed in the previous section. Therefore, the dominance of this theme was somewhat of a surprise given that the process of selection to Class X was a practical task with no technological element. Despite this, the teachers held a strong belief that the most effective collaborators in Class X were generally students who were able to use their existing technological skills, which all of the teacher's discussed as being a critical to the success of Class X. These skills were articulated as a fostering of positivity towards the use of technology, which served to enable students to either accept, or reject, a

particular technological innovation. This suggested that there was a general consensus amongst the teachers that prior experience with computers was a potential influence on the effective delivery of online learning.

For example, LTCX stated "*previous use of technology from a student's perspective makes this process easier. And what I mean by that is that they have a sense of familiarity - both with hardware and software".* LTCX articulated this as *"an academic drive"* to use technology in learning environments - and that the students of Class X are high achievers. They are, in his eyes, students who are not satisfied with using technology for simple browsing - they have, in effect, a more rigorous approach to browsing.

LTCX "*those students aren't going to be satisfied with the first thing they see. They have better skills to use the computer because they have the desire to do better than their classmates - that's why I wanted to get the students with the better grades as candidates for Project X in the first instance"*

This was also the first indicator of the link LTCX made that students who are more used to filtering and browsing for information online are more likely to be more academically proficient. This relationship between a student's academic ability and technological ability was to become more apparent as the conversation developed, particularly when he described how effective online collaboration could not be achieved very easily without it.

This explained why LTCX had decided the students of Class X had to satisfy minimum academic requirements, as he believed this demonstrated that they already have some degree of technological competence.

LTCX *"Students academic ability and their technological ability is related. I think that seems quite obvious. Remember we are not talking about kids who use computers to talk we are talking about kids who are already thinking about doing more than their classmates."*

LTCX *"When students can demonstrate that they have a competency with online tools, they can use those tools effectively for learning. In my opinion, there is also a real difference between students who take what they find online as given and students who use their technological skills for a higher purpose. It is these students who are the ideal candidates for Class X as they have more advanced technological ability."*

LTCX *"it is imperative we have students who are confident using computers when we are selecting for Class X."*

Although I initially understood LTCX's views as being specific to technological ability, I began to question if there was a more practical purpose in finding the brightest and most motivated students to be part of Class X. This was because LTCXX moved the conversation along to discuss how *"the process would be much quicker",* if students already had good experience of browsing. This

suggested that it was not just a simple question of student abilities, but also a question of how quickly they would accept online learning. He spoke, for example, about the "*ease of process*" from which students are selected for Class X. This further suggested that there was an element of practicality about the selection of Class X students, as students who already had a degree of competence and confidence using computers, would find the process of online collaboration easier and potentially, faster to adopt.

Similarly, STCX gave examples of the difference between Class X students and other students who had less technological ability. She understood this as a demonstration of enthusiasm to learn, much as LTPX had articulated, where students *"learn using a computer in a better and more informed way*". She also similarly linked student's technological ability to their academic ability but most specifically related this to a difference in their online behaviours.

STPX " *Students we have selected for Class X have different online behaviours to their peers. They are more committed to use computers to learn because they are students who are already achieving higher grades"*

JTCX also specifically referred to technology as having *"particular effects on learning",* believing that it was important to select the "*right candidates for Class X."* This, she believed, showed that they possessed the right qualities to be Class X students as they had "*the commitment for learning which makes them ideal for Class X."* This commitment was demonstrated by the fact they were

"*performers in the classroom",* which also suggested that JTCX saw a link between technological ability, academic ability and effective online collaboration. Indeed, it was a prevalent feature of all three conversations that the *"academic drive"* to use technology in learning environments was seen as critical to promoting the online collaborative dialogue Class X is promoting.

4.11 Key Theme Two – Students' Academic Ability

Referring back to the first part of the analysis, it was clear that the three teachers believed there was a link between students with higher academic ability to students with students who had more capability to collaborate online. This was primarily because these students were already confident to use the computer in a more methodical and rigorous way as opposed to lower grade students who, they believed, used technology primarily for more personal, rather than academic use. As I discussed previously, this somewhat explained why only students with higher academic ability were chosen for Class X, because the teachers believed that these students would find online collaboration more natural. Therefore, from one perspective, it appeared that the teachers believed that a student's academic ability presented both an opportunity and a challenge to collaboration. This explained why there was no assessment of the student's technological ability in the selection process, which I had initially wondered about. However, I was still not clear about how this linked to effective collaboration.

From one perspective, this “capability” to use technology is not an uncommon characteristic, particularly when I looked at previous research that centred around the effectiveness of online learning. For example, Colley et al. (1994) maintained that prior experience and having a computer at home are both significant influencers to effective online learning and their results demonstrated the importance of experience, particularly in a home context (Colley et al 1994). However, in the context of Class X, this link seems to be less clear. Were the teachers saying more about the ease or speed of access to technology as a barrier to collaboration, or was it about their cognitive ability? After discussing this in more detail it seemed more apparent that, although the teachers believed that students of lower academic ability use technology frequently, they believed that this did not transcend into an ability to use technology for learning purposes.

For example, LTCX discussed how more academically capable students are able to apply their knowledge to different fields, stating, *“I know the more academic the student, the more capable the student and that capability is not just in Math. It would be an application to almost anything. They are just the more capable students*”. Similarly, STCX stated that from her experience, “*the higher grade students are more at ease with technology in the sense of using it for different purposes*”. She also believed that, if students had an “*academic base*”, then it was clear that they would have a “*technological base*“ that she believed enabled them to collaborate online more easily. This added to my belief that the teachers of Class X may be thinking more towards the ease and

speed of use of online learning, as opposed to a more general view of collaboration particularly when I looked again at the frequency of the codes "time" and "speed". For example, the statements, "*It's not so easy with kids who don't have the drive to get the better grades*" and "b*ecause the lower grade students won't be so comfortable with computers so the whole process takes a long time*", both suggested that the teachers were focused on the relative advantages or disadvantages of online delivery in terms of how quickly Class X could be put into practice. This made me consider if this was one of the strongest reasons why the teachers related academic ability to online collaboration. Looking at the statements below by JTCX, this seemed to be worth considering.

JTCX *"the students in Class X make the better collaborators because they are quite smart already when it comes to computers. Maybe it comes more naturally?"*

JTCX *"to be able to communicate online in a productive way requires a certain amount of discipline I think because it is easy to become distracted by technology. The more capable students are more disciplined in this way and we don't have to worry about them playing games or going off subject."*

Similarly, LTCX reiterated who the *"ideal candidates*" were for Class X. They

firstly had to be motivated to learn, secondly, have a particular mindset towards technology, and, thirdly, be disciplined in the use of technology. If they possessed these skills, LTCX felt that they would be successful online collaborators. Therefore, effective online collaboration for LTCX seemed to be linked to a certain student attitude towards technology and this also seemed to concur with STCX.

STPX *""The Class was conceived from a focus on a particular type of collaborative construction. Students need to have the ability to navigate through this content without being tempted to do other no academic things. So for us as a f faculty you can't have successful online collaboration and discussion where students are so easily distracted and this means that the more able students are for us, the ideal candidates."*

4.12 Key Theme Three - The Technologies of Class X

The third theme encompassed the three teacher's belief that the technology that Class X uses, particularly the quality and type of the interface, is also a crucial factor in facilitating online collaboration. In a more general statement, LTCX discussed the concept of technology as being the "*cause of change*" in that it will, in the future, be a *"cause of change in both learning outcomes and teaching efficiency".* This indicated that LTCX saw technology as serving as a

catalyst for institutional transformation, because he believed that schools are continually being challenged to make education and learning more relevant. LTCX gave a particular example of this where he had seen the technologies of Class X cause improvements in his classroom.

LTCX *"So kids with no coding or programming experience, I set them a task - look at this gDoc and see what you can do. OK yes most students were apprehensive - but the enthusiasm - the concentration! And I loved this bit. The kids were like, no Mr XXXX I don't get it I can't do this. But they did it - I am telling you they didn't need me - they needed that computer - that tool."*

He appeared to believe that the learning occurred because of the technology. Equally, STCX provided the example below when asked about technology as the cause of change.

STCX *"I was standing by - but in the classroom, the students are putting their work into a Google document that Mr XXXX had pre-coded, so the feedback to one another is available in real-time. Compare that to a more normal school set up. No one is using pen or paper. Everything is recorded online and this is all achieved using*

the chosen technologies of Class X which are most often the blended learning softwares of Google Classroom "

JTCX was also clear that the technology of Class X was critical, "*I would say the technology is the key - without it Class X would not exist".* So, to some extent it was not surprising to see that the technologies Class X used were an important factor in what the teachers perceived to be an opportunity in collaboration. However, there was a strong suggestion that the teachers linked a very specific interface, namely "Google Classroom", to improved learning outcomes and teaching efficiency, rather than a more general view of technology and learning. For example, there were frequent references to Google Classroom, which I shall refer to as "GC", which gave the impression that the teachers had a preference for using this specific interface.

STPX *"It is Google classroom which gets the kids to work together."*

JTPX *"I can't see how Class X can work without the capabilities of Google classroom. It is kind of imperative to the students - well to us as well."*

LTPX *"Classroom is able to do something we have been unable to do as teachers. It actually prioritises training children in skills like teamwork and problem-solving and it is about*

	time. I haven't found a sustainable argument to suggest why students can't ask Google for the answer if the answer is right I don't think online dialogue in the type of classroom set up we have is possible without Classroom."
LTPX	*"Classroom is the future of education because in my opinion it is technological reform that we need."*
STPX	" *I see power in Google classroom as a collaboration tool. If we want students collaborating in small groups - classroom can be a powerful tool to make that happen."*
STPX	"*There are also logistic reasons why classroom works so well for collaborative effort."*
JTPX	*"Classroom is the only way we can create real time classes with just a few clicks."*

There was, then, a majority view that it was the particular technology that Class X is affiliated to that created the most opportunities for collaboration in the classroom. So, whilst students technological and academic ability were more dominant themes for the teachers of Class X, promoting online dialogue was not considered possible without the affordance of Google Classroom as an interface.

This may not be too surprising, given that GC was created for schools with a specific aim to simplify the creation, distribution and the grading of assignments online. In addition, the primary purpose of GC is to streamline the process of sharing files between teachers and students. Therefore, from this perspective, it would make sense that the teachers would believe that it bears influence on the effectiveness of online learning. However, GC is generally considered an interface that allows for both synchronous and asynchronous communication. Consequently, the preference for the use of an interface that is designed for both face-to-face and online was interesting, in the context of Class X.

When LTCX discussed the learning objectives of Class X more specifically, it became clearer that he believed online collaboration was more effective when people were networked, which made the connection with GC clearer. For example, one of the proposed advantages of using GC is that the platform was specifically designed to help teachers integrate classroom technology and streamline the process of going digital. GC therefore, has the potential to be a virtual classroom space.

The technologies of Class X were also discussed as part of a wider need for technological innovation in the classroom. LTCX reiterated that student's ability to gain technological competence in the classroom was, "*too important to ignore much in the same way as reading and writing",* likening this to the need for children to use computers competently as a critical life skill.

LTCX "*we need to look forward and not behind and this goes for schools, businesses and the like. There is no point pursuing the same goals as we did in the years before technology became the all."*

Interestingly, he strongly inferred that the consequences of not implementing technology in the classroom were very serious. In fact, he termed this as "*neglect*" as "*technology* is *too important to ignore much in the same way as reading and writing. You can't ignore progress".* Comparably, STCX saw GC and technology as a whole as a necessary part of any classroom, comparing the computer with any other piece of furniture that is necessary to make the *"job of learning easier in the same way that a chair is there to sit on".* In the same way as LTCX, she used the term "*neglect*", although she specifically linked this to the way schools only favour online learning when students reach university age: "*why are we waiting so long to get students doing this? It's college level at best and then for students it's a total change to the way they are used to working. So when I think that we are neglecting students that's what I mean. We are waiting until they are older before introducing these things and I never understood why."*

As well as discussing aspects of the current curriculum, she went on to discuss the possibilities for a future curriculum, particularly the opportunities that technology creates for both teachers and students when students are enabled

to engage critically with media, rather than being distracted by it. She used a couple of examples to illustrate this and explained why Class X was a good example of how technology can facilitate different forms of dialogue in the classroom.

STCX "*We are used to face-to-face teaching environments where digital technologies are used only as a small component of students' learning experiences. I think this is narrow minded. Take a student and give him or her the right tools and they will learn to use it critically. It's not always a distraction and so many teachers believe that's all it is. But I think that's just because we have gotten so used to teaching in a certain way we are closed to new ideas. Technology doesn't have to be a distraction."*

Therefore, STCX saw online learning in the classroom as requiring an institutional shift, much in the same way as LTCX.

STCX *"It's not just about digitally mediated learning environments, like online learning or distance learning. It's about shifting the balance from the face-to-face to the technological - that's why Class X should be more widely considered in the province. It proves technology needn't be a distraction"*

As a consequence, when I started looking at this theme as a whole I began to question if the teachers of Class X were saying that collaboration, when mediated from machine to human, is different to collaboration between human to human. So, in effect, when we collaborate through the medium of technology does this fundamentally change what collaboration means? Certainly in today's world, we think of ourselves as an individual with a rational mind, and therefore often we describe our relationship with technology on this basis. However, this is a challenge. If we believe that collaboration is differently conceived when a machine is involved are we, in effect, asking what influence does one have over the other?

4.13 Key Theme Four - The role of the teacher in Class X

Looking at **Technologies of Class X,** particularly how closely the teachers had linked the student and the technology with collaboration, I wanted to try and understand what the teachers believed their role was within Class X. This was because there was some suggestion in the literature I examined that the teacher's role becomes somewhat superfluous when children learn online, in self-organising groups. LTCX had been reasonably clear in vocalising his beliefs that technology was the "*cause of change",* which he discussed as being a need for institutional reform of education as a whole. Interestingly, he believed this change also applied to the role of teaching, which he described as being an "*outperformance*" of machine over human. Far from being an unwilling act, he believed that we are already, "*handing over more and more of what happens in*

our world to the speed and efficiency of the computer". He also went further to state that "*the machine can already do the tasks teachers did, but they can do it faster and better*". LTCX viewed this point as being hard to argue against because, if computers can do the task of teaching better, then there is a case for making the use of online learning obligatory in every classroom. However, he also described technology as "*the ultimate tool",* which also suggested that he believed that technology required a human influence. LTCX therefore appeared to resonate with the view that, technology was a tool to be manipulated by humans.

LTCX *"The way I see it is computers are just part of advanced technology and like it or not they will outperform a human being at every turn. Like artificial intelligence of wearable sensors, technology is the ultimate tool."*

He described teachers as being the, "*facilitators*" of learning, which is a cultural term, frequently used to describe the relationship between teachers in computer-mediated education. It is also used quite prominently when describing project-based learning approaches in learner-centred environments, not dissimilar to Class X. He was careful to point out that the term in the context he was using it in did not mean teachers who were "*robotic*", but that "*robots may - be part of that facilitation".* This suggested that he saw technology as having a significant influence upon teachers. He also stated that, in the future, "*we might not need teachers at all",* as learning moves away from the construct of

teaching. Therefore from one perspective, when the teacher talked about how technology can speed up the process of teaching, it seemed to suggest that he viewed technology as a human tool. However, from the other perspective, he believed that technology will potentially completely replace teachers. This made me question if he believed that the power lies with the technology and not the human, which I felt he was suggested in the comment, "*the more we can increase the students access to technology and when we see their skills increase, the more we can step back"*.

STCX also discussed the principle of technology *"speeding up"* the process of learning for students. When discussing her role on a particular task she stated that, "*I don't believe I was necessary they would have done it without me - maybe a bit slower!"* This, I believed, conveyed the same sense of outperformance as LTCX had suggested. Furthermore, she believed that students currently "*manipulate*" the time of the teacher because they preferred to ask teachers where information is; in other words, they prefer to take the easy route. She therefore saw technology as making the process of learning more child-led and less teacher-led. She also made reference to a similar new construct of the teacher that LTCX had also discussed.

STCX *"Computer-based tools are well matched to supporting the sorts of mental activities we used to associate with the text book. And students have way more capability than we give them credit for. Our job as a teacher isn't the same in this type of set up. Once*

kids are given the tools of technology, they are able to work things out for themselves. That's what the Internet is after all, just a huge resource of knowledge."

This she likened to the creation of a network of learners who have more control over their learning and who are manipulating "*the technology they love to use and not manipulate the time of the teacher"*. This manipulation of the student over the teacher she conveyed as negative, particularly because the student required more effort when they had to "*find the answers to the questions themselves".* Therefore, for STCX, the presence of the teachers made students more reliant on instruction and less reliant on their own abilities to learn. Therefore, STCX believed that teachers' time was *"better spent"* when students have developed a more autonomous approach to learning, which was facilitated by the Internet.

This is why STCX felt that it was so critical for students to develop technological competency above all else, despite the initial fear they may feel when starting Class X:

STCX *"Some students carry with them a fear of the computer because it is easier to ask the person next to you than it is to think of the questions to ask of the computer. But I think that's a confidence issue. I don't think teachers should be just answering questions that students can already answer so if we equip students with the*

skills they need to find things out for themselves then that should be the goal."

JTCX also saw a link between the increased use of technology in the classroom and a change in the expectations of teachers:

JTPX "*When students are placed in different learning situations like our project, there is a change, which is to be expected when the students are mostly collaboration online I think. Maybe it's that students expect something different from us and we from them?*

She also believed that students will be enabled to become more responsible for their learning when they learn online:

JTCX *"It isn't our job to teach the children. That isn't the aim of the Project. The students take some of the responsibility away from the teachers and on themselves which has to be a better system."*

Consequently, the use of technology in learning was considered the main factor in why the teachers believed their role had changed. Whilst there was some suggestion that the technology was a tool to be manipulated by a human, there was also a sense that this was not the case - as there was an implication that in the future, their presence would not be necessary at all.

4.14 The Online Discussion

Although the study is mainly qualitative, the analysis of the asynchronous discussions has a quantitive dimension, the idea being that a thematic comparison could be used with data that has been inductively coded. As discussed previously, the goal of using the chosen methods of data collection for the online discussion was twofold. Firstly, to classify the messages into speech acts and, secondly, to analyse the thematic data qualitatively. The purpose, therefore, was to present the speech acts in a quantitative form and to then conduct a qualitative comparison of the themes, in order to build theory within the analysis that was grounded from the data itself.

I arrived at the research question, "**How is participation patterned between students and teachers in an online discussion?**" because I was interested to see how Class X was exemplified in practice. The pre-visits and my participation in the selection process had given me a sense of how the curriculum for the students of Class X was delivered, the overarching principle being that students are expected to collaborate online. Therefore, looking at some examples of these dialogues between the students and the teacher was important in order to understand more comprehensively the relationship between the participants and how collaboration was patterned between them.

I was provided with access to three discussions that took place over two school terms. The online discussions consisted of one that occurred during Term One

and two that occurred during Term Two. The first discussion during Term One was contributed to over a period of 2 weeks, the second discussion during Term Two was contributed to over 3 and a half weeks and the final discussion, over a period of 3 weeks. The discussions were initiated by the teacher who began each discussion with a “big question” that is a terminology used within SOLE projects to define questions that are open, difficult and potentially unanswerable. The aim is that a “big question” will encourage the students to participate in deep and long conversations, rather than finding easy answers. The big questions were:

Discuss the key issues faced by Canada’s indigenous people
Will robots be conscious one day?
Why do things fall down and not up or sideways?

Each message within each discussion was thematically coded into corresponding speech acts - the assertive, the commissive, the directive, the declaratory and the expressive. These are depicted on Tables 1 to 3. On Table 4, the overall frequencies and percentages of the speech acts from all three discussions were presented. The messages were initially coded into verbs which were taken from Searle’s original paper,”A Classification of Illocutionary Acts” and are those he considered to be indicative of speech acts. These are listed below:

Representative Keywords: Hypothesising, insisting, boasting, complaining, concluding, deducing, diagnosing, claiming, suggesting, calling, and believing.

Directive Keywords: Asking, ordering, commanding, requesting, begging, pleading, praying, entreating, inviting, permitting, advising, daring, defying, challenging.

The Expressives Keywords: Thanking, apologising, congratulating, condoling, deploring, welcoming.

The Commissive keywords: promising, guaranteeing, swearing, pledging.

The Declarative Keywords: Creating or modifying social relations be performing certain declarations.

The goal was to try and use Searle's original speech act definitions as the basis for the coding and within the analysis. I have given examples from the discussions in the appendix, in order to illustrate how these speech act classes were manifested in each data set.

4.15 Table 1 – Frequencies and Percentages of Speech Acts From Discussion One During Term One

"Discuss the key issues faced by Canada's indigenous people"

CODE	SPEECH ACTS	FREQUENCY	PERCENTAGE
1	REPRESENTATIVE	2	2.6%
2	COMMISSIVE	3	3.9%
3	DIRECTIVE	31	40.7%
4	EXPRESSIVE	40	52.6%
5	DECLARATIVE	0	0%
T	TOTAL	76	100%

This discussion was initiated by LTCX with the "big question". Classified as a directive speech act as the initiator (LTCX) had an expectation that the students should do something as a response, it was duly responded to. However, the responses were, in the main, classified as expressive speech acts. This was quite surprising, given that the expressive speech acts did not relate to the question. In the most part, the expressive speech acts were examples of students greeting each other. For example, "Hi" was the most common expressive used and this indicated to me that the students did not respond to the initial question from LTCX. Moreover, they were using the online discussion to state their presence within it to their peers. This explained why, in this discussion, LTCX issued further directives such as, "*So, we have all said hello*

to each other - can we get back to task. How do you think you are going to approach this question. Please discuss". This was then responded to by further examples of expressive speech acts categorised as apologies, for example, "Sorry Mr XXXX". LTCX then tried to reengage the students with the use of directives, " *I note that in the following link, there is some suggestion that some indigenous populations are facing serious employment issues. Any comment?"* However, the students only responded by thanking LTCX, for example, "Thank you Mr XXXX".

Looking at the examples of each category of speech act, there was a clear sense that LTCX was the main contributor of content to the discussion, because he was the only participant who used directives. In addition, he was the only participant to use representative speech acts, on one occasion questioning why the students had not responded and, secondly, insisting that they report to the group what they had found. Despite this, the students continued to only contribute to the discussion by thanking LTCX, apologising to LTCX and in the only three examples of commissive speech acts, stating that they would action his request.

4.16 Table 2 – Frequencies and Percentages of Speech Acts From Discussion Two During Term Two

"Will robots be conscious one day?"

CODE	SPEECH ACTS	FREQUENCY	PERCENTAGE
1	REPRESENTATIVE	0	0%
2	COMMISSIVE	0	0%
3	DIRECTIVE	21	18.7%
4	EXPRESSIVE	91	81.3%
5	DECLARATIVE	0	0%
	TOTAL	112	100%

Discussion two was initiated by LTCX with the big question, "Will robots be conscious one day?" As had been the case with discussion one, the responses from the students were predominantly expressive, with the students welcoming and greeting each other to the discussion in the first instance. LTCX, at this stage, redirected the students' attention to the subject in hand. For example, he asked the students *"What are your opinions about this?"* and *"Who believes that AI will replace humans?".* It was notable that the students did not respond. In fact, there was a lengthy gap in this discussion where no messages occurred at all. After this period of inactivity, LTCX again initiated the conversation, providing the students with a Google Document he had created with a collection of online reading materials and suggested websites. This resulted in further examples of expressive speech acts from the children as they thanked LTCX for the

information. Therefore, discussion two revealed a very similarly constructed conversation as discussion one, where the teacher was the only contributor of content and the student's were found to initially greet each other and then thank LTCX for his guidance.

4.17 Table 3 – Frequencies and Percentages of Speech Acts From Discussion Three During Term Two

"Why do things fall down and not up or sideways ?"

CODE	SPEECH ACTS	FREQUENCY	PERCENTAGE
1	REPRESENTATIVE	3	2.3%
2	COMMISSIVE	9	7.1%
3	DIRECTIVE	21	16.6%
4	EXPRESSIVE	93	73.8%
5	DECLARATIVE	0	0%
	TOTAL	126	100%

Discussion three was initiated by LTCX with the big question, "*Why do things fall down and not up or sideways*? In response, as had been the case with the other two discussions, the students greeted and welcomed each other to the discussion. They did not respond directly to the teacher or make any reference to the question. For example, "*hey XXXX", "Hi, how are you?*" These informal greetings were met with further messages from the teacher, "S*o, now you have*

had a chance to think about this, how are you going to approach it. Discuss." and "*Tell the rest of the group where you are thinking might be a good starting point.*" For the first time, a student made a suggestion to the group which was considered to be a commissive speech act, in as much as he was suggesting a course of action, "*I would say we should be thinking about Newton?"*. This was met with commissive speech act responses from the teacher as he made three separate suggestions. Firstly, by sending some hyperlinks, secondly, to suggest which of the Class X students might want to work on this with the other student and thirdly, by insisting that other students must get involved, "*XXXX has given you a start, but I am not seeing the effort from the rest of you".* At this point, the first of two directives was given by the students of Class X, "*I've found this. So who is going to help? Can we agree that I will start on the nature of orbits?"* However, there were no responses and again there was a reasonable gap before the conversation was re-initiated by LTCX, this time, with a distinctly more insistent tone, "*XXXX has same this suggestion. It isn't appropriate no one has responded. So, I will ask again, if XXXX is starting on the nature of orbits - what are the rest of you contributing?"* This was met with a few students apologising, categorised as expressive speech acts. After this point, another student made a directive speech act inviting specific students to assist with one of his ideas. However, the students did not respond which made way for LTCX to continue to issue challenges to the students, for example, *"I wonder if anyone of you have considered the coin experiment to verify this phenomenon?"* Several students responded with more expressive speech acts as they thanked LTCX, which resulted in LTCX issuing his final directive, stating, *"I assume you*

all have seen XXXX's work about the sun being nothing more than a massive collection of all the matter from the formation of the solar system that wasn't moving sideways fast enough. Discussion?" At this point, I had hoped to see some direct responses. However, the students responded by using more expressive speech acts as they congratulated student XXXX for his effort and this concluded the discussion.

4.18 Table 4 – Total Frequencies and Percentages of Speech Acts From All Discussions

CODE	SPEECH ACTS	FREQUENCY	PERCENTAGE
1	REPRESENTATIVE	5	1.6%
2	COMMISSIVE	12	3.8%
3	DIRECTIVE	73	23.2%
4	EXPRESSIVE	224	71.3%
5	DECLARATIVE	0	0%
T	TOTAL	314	100%

Comparing the speech acts from the online discussions as a whole, it can be concluded that the frequency of expressive speech acts was by far the most common communication. This was, on the whole, evidenced by students welcoming each other to the discussion, thanking LTCX, apologising to LTCX and congratulating other students. In terms of message boards in a more general sense, expressive speech acts are known to be very common because

people often greet others at the beginning of a post. Therefore, from this perspective, the data I found was indicate of this. However, it was a surprise to see the dominance of this category, because the principle of collaborative activity is that a group of people work together toward a common goal. However, this could not be evidenced in these examples because of the overwhelming use of expressive speech acts, which were generated from the students. This made me question the kinds of interactions and outcomes that the teachers count as “collaborative” in Class X. On the basis of the online discussions alone, it appeared that the teachers of Class X made a strong connection between participation and collaboration as, despite there being limited “collaborative” activity (at least in the more recognisable sense of the term) between the students, the students did participate by virtue that they had an online presence.

The second most dominant speech act were examples of directive speech which generated just over 23 percent of the messages. The majority of the directive speech acts across the three discussions were generated by the teacher. However, as many directive sentences are posed as questions, I was not entirely surprised to see that LTCX was the dominant author. However, it was surprising to see that there were only two examples of the students using any directive speech acts. Out of 73 questions and three discussions, only two examples originated from the students. This means they represented just under 3 percent of all the classified directive speech acts. I believed this said something important about the teacher and student relationship. LTCX’s use of

directive speech acts drew attention to his important role in the discussion, as his presence appeared to be critical in maintaining the flow of conversation. Referring back to the literature review this seemed important, particularly as there is some suggestion within the SOLE that a teacher can effectively be displaced because technology facilitates collaboration. However, the data from these discussions reject this view, because there were many instances where the teacher had to re-focus the students, and this suggests that, if he had not, the discussion may not have continued at all.

Commissive speech acts were recorded 12 times, with a percentage of just under 4 percent, and were typically found to be examples of students promising a course of action. For example, comments such as, "*I will get this done*". In addition, there were three examples of commissives made by LTPX that were directed at the students and made in the form of suggestions. All of the examples are considered to be common uses of commissive speech acts because commissives are usually classified as activities one will become involved in. Furthermore, they generally support the provision of information about a person's intentions or future activities. Similarly, commissive speech acts are used to provide information to others. In the case of LTPX this was accurate as he had made suggestions to the students as to how they might tackle the "big question" at hand. This also suggested that the teacher had a pivotal role within the discussion and thus his or her presence was critical to supporting the collaborative activity.

There were very few examples of representative speech acts with less than 2 percent categorised. When I referred back to Searle's taxonomy, this seemed somewhat surprising. In Searle's description of representative speech acts, he discussed how representative speech was identified by a commitment from the speaker to the truth of an expressed proposition; it represents their belief of something. In the context of Class X, I expected there to be more examples of representative speech acts within the three discussions, especially as research has indicated that when online communication is compared to face-to-face conversation, there are more examples of disinhibited behaviour. That is, students are thought to be less inhibited in online discussions. For example, Dietz-Huhler and Bishop-Clarke (2002) were indicative of the view that a deindividuation or disinhibited behaviour is a distant characteristic of CMC. Their research demonstrated that students made more commissive speech acts on discussion boards. For instance, they frequently had strong opinions and shared hypothesis, opinions they were less likely to share, if they had been face to face. Dietz-Huhler and Bishop-Clarke also suggested that, in addition to having strong opinions in online discussions, loss of performance is also associated when people participate within online spaces, because when members of a group are not face-to-face, they feel less accountable for their performance and, as a result, they tend to work less hard (Karau and Williams 1995 and Dietz-Huhler and Bishop-Clarke 2002). Karau and Williams 1995, also examined the effects of "social loafing" and its plausibility in terms of collective efforts. They located that collective work settings, such as Class X, are highly susceptible to "social loafing" because "an individual's outcomes frequently

depend less on his or her efforts when the person is working collectively that when the are working coactively" (Karau and Williams 1995, p. 137). Therefore, there is an implication that a student will work harder in a collective task when they expect their efforts to achieve valued outcomes. In addition, Karau and Williams examined the arousal reduction viewpoint, which views that arousal enhances the drive and effort of a person. This facilitates more dominant responses from the participants. If the task is unfamiliar or novel, it is more likely that there will be less dominant responses from the participants. In the context of a SOLE, we know this to be true. This is because, as we know, the participants of these online discussions were previously situated within learning environments that supported synchronous discussion, as opposed to Class X, which supports asynchronous discussion. Therefore this raised the question, does communication differ for students when they are online when compared to face-to-face and, if so, does this affect collaboration itself?

Finally, there were no examples of declarative speech acts that are broadly categorised as sentences which make assertions. This may also be linked to the novelty of Class X, but also may highlight how collaboration online is not as "natural" for children as had been suggested and discussed within the literature review. A group of students who were used to communicating synchronously, that is, may not find collaboration easy at all. This gave me a strong sense that collaborative learning and building an online community that promotes collaboration takes time, which suggests that the role of the teacher is pivotal. This indicates that collaboration needs to facilitated by a teacher.

Chapter 5: Discussion

5.1 Introduction to Discussion

This study has examined online collaborative dialogue within a self-organised learning environment called Class X, firstly, from the perspectives of the teachers of Class X and, secondly, by categorising three samples of discourse taken from Class X into speech acts. The participants for the interviews were all of the Class X teaching faculty and the participants for the online discussion were the 2017-2018 student cohort of Class X and the three Class X teachers. A qualitative research design was used for the semi-structured interviews followed by an analysis of the asynchronous discussion that aimed to identify speech acts, namely the five different speech act classes of commissives, directives, expressive, representatives and declaratives.

The analysis of the interview data generated four themes from the research questions. Students' technological ability was linked to the teachers' belief that technological skills are critical to online collaborative learning, because they believed it fostered a positive mindset towards technology. This enabled students to accept a particular technological innovation such as Class X. Student's academic ability was connected to the idea that students who had a higher than average academic ability would find online collaboration easier, because they believed academic ability and technological ability is linked. The

technologies of Class X was specifically linked to the connection between the use of one specific software, Google Classroom, and the students' ability to collaborate online. This was conjectured to be a particular obstacle that affects the collaborative process, as the teachers believed Google Classroom creates more opportunities for students and teachers to share and lead discussions in cross-cultural online environments when compared to other softwares. The role of the teachers linked to the idea that the teacher's role becomes somewhat superfluous when children learn online in self-organising groups. This represents an opportunity for student collaboration, because students who are self-organising are also less reliant on instructional teaching. Therefore, when considering the first question, "What do teachers see as opportunities in collaboration in online discussions?" the results showed that students' technological and academic skills were the most important factors, followed by the choice of software and the minimally instructive role of the teacher. Whereas, the second question, "What do teachers see as difficulties in collaboration in online discussions" revealed that this was linked to their perceptions of the types of interactions between students who only had limited technological skills and an inability to use more complex softwares such as Google Classroom. This is because they lacked the motivation to use technology for learning purposes, as they had limited academic ability. This resulted in a higher reliance on the teacher to support their learning.

The analysis of the online discussion data aimed to answer the research question, "How is participation patterned between the teacher and the students

in online discussions?". By generating data which fitted within the five speech acts of commissives, directives, expressive, representatives and declaratives, the aim was to examine the conversation more closely to see who was influential to the discussion, because the participant interactions are an important way to measure collaborative performance. This is specifically linked to the idea that identifying whose interactions were whose would give some measure of how collaboration was patterned between the two sets of participants; particularly as the quality of group discussions has been viewed as a frequent problem for students, particularly in online discussions. In addition and from the point of view of the teachers, a teacher presence in these discussions was not deemed necessary to the production of shared knowledge. Therefore, I was interested to see how this was exemplified in practice.

Looking specifically at the data, the most common example of speech act was the expressive function, which generally occurred within the discussion when a student expressed his or her psychological state to the other students or the teacher. The most common examples of this were an expression of gratitude, an apology, a congratulation or a greeting between the students. The second most dominant speech act were examples of directives which were made typically when the teacher expected students to do something. For example, in the use of instructions and requests, or when they invited the students to do something. There were only two examples of students using directive speech acts when compared with 71 from the teacher and thus, the teacher was the most dominant author. The third most common speech act, albeit with far less

entries, were commissive speech acts, which were categorised as students promising to do something and exemplified in suggestions made to the students by the teacher. Representative speech acts were the fourth most common speech acts, but with five entries across the three discussions, were far less common. There was no evidence of any declarative speech acts which were broadly classified as sentences which make assertions.

In effect, when I looked at these two sets of data, I was presented with what I perceived to be two different stories about the concept of collaboration in Class X. On the one hand, I had the interviews with the teachers who strongly inferred that students would be able to transfer their academic ability into utilising the communicative practice of an online learning model, by virtue that they have existing technological skills. On the other hand, I had the data from the discussion, which showed that students mainly used the discussion to thank, apologise or greet each other and not, as was suggested, as a medium for collaboration in a learning context. In addition, the interview data suggested that the role of the teacher is very different in an online discussion, because the students take a more active role in their learning. However, the data from the discussion revealed the opposite, that the teacher's presence and interactions seemed important to the discussion, because all but two examples of directive speech acts were generated from the teacher. This lead me to believe that the teacher was far from peripheral. Therefore these key findings will be examined further throughout this discussion.

5.1 Key Finding (A): That Teachers Believe That Online Collaborative Dialogue Is More Successful With Students Who Have Had Prior Technology Experience

There was much in the data to suggest that a positive mentality towards technology was connected to making the process of online collaboration easier and quicker. This shares similarities to Ellul's core philosophy that human beings are constantly looking to speed up all of the processes of human activity, because we are primarily motivated by efficiency. Consequently, when referring back to the data, this suggested that whilst teachers shared the vision of Prensky's "digital native", whose members would find online collaboration easier by virtue that they have more experience with technology, they did not believe that all young people are digitally native. Rather that they are shaping the concept of the "digital native" in a new way by suggesting it is linked to academic ability.

This connected to the idea that students who view technology with a certain mindset are more likely to be able to collaborate online. Consequently, there was a strong association made between ability and confidence with online learning technologies and successful collaboration. This suggested that the most significant barrier for online collaborative activity was having less faith in technology, as opposed to viewing technology in a more positive light. Referring back to the literature review, this appeared to share parity with Ellul's view of technological mentality, which he connected to the faith man has in technology

and that supersedes all other forms of human reasoning. This, Ellul linked to the human endeavour to believe in the power of technology at any cost. Thus, the technological mentality Ellul speaks of is similar to the construct of a technological mindset, because both are arguably formed by “an accumulation of means which has established primacy over ends” (Ellul 1964,p.394).

Therefore, in the context of this research data, we are looking at the “digital native” from one particular perspective and one only - that a person who is digital literate accepts digital enhancement more readily, and is thus more likely to find online collaboration more natural. As we have claimed, this is not to suggest that all young people are “digitally native”, rather that they are “digitally native” only by virtue of their academic ability and their experience with technologies. Thus, the study does not accept Prensky's originally conjecture that all young people ascribe to the view of a new net generation.

5.3 Key Finding (B): That Teachers Believe That Online Collaborative Dialogue Is More Successful When Students Have A Higher Academic Base

In Prensky’s most recent description of digital wisdom, he looks at the conjecture that an emerging digitally enhanced person, or a person who possesses digital literacy, is different from someone who is not digitally enhanced. This seems to suggest that Prensky shares the belief that a person’s positive mindset to technology is just as important as their immersion in a digital

world. This is because Prensky views that a person can become digitally wise when he or she accepts digital enhancement as an integral fact of human existence. This is different from his perception of the digital native, because the digital native is perceived to be any person born within the age of digital media, whereas digital wisdom is concerned with the acquisition of digital skills and knowledge (Prensky 2009, p.3). As we know from the data, the teachers of Class X did identify with some of the characteristics of Prensky's digital native, particularly with the concept of digital literacy and the mindset towards technology. However, they did not believe that all young people are digitally native. Nevertheless Prensky's concept of digital wisdom does appear to offer some possibility that the link between student's technological ability and student's academic ability I had identified from the interviews potentially connects with Prensky's more recent vision and idea of digital literacy.

There is some conjecture within the literature concerning the use of technology in the classroom that supports this, particularly in claims that there is a particular mindset towards technology that makes the integration of technology into the curriculum more successful. Prensky for example, specifically connected this to the idea that wisdom and technology are linked, because all technology requires wisdom in its use and thus a person needs to hold a different opinion and belief about what makes us human. This, he argues, is because, if we assume that nothing on earth will ever surpass humans, we would never truly be acceptant of the power of technology. He aligned this with how we choose to identify with being human, because there are some who

believe that humans are not just a species, but are differentiated from the rest of the universe by something special. Consequently, with this mindset, human beings are considered to possess something that technology can never replicate, and it is this that affects their ability to integrate technology successfully. Therefore, those who are of the belief that we should preserving our humanity, as Prensky would define it, are not open to discussions about digital technology.

People who believe that technology can and will surpass every human endeavour, possess a different mindset to those who still believe in the supremacy of the human race. This type of view, which depicts technology as a powerful force, creates a sense of inevitability about technology which connects back to Ellul's view of the human technological mentality, in which man has so much faith in technology that technology comes to supersede all other forms of human reasoning. Therefore, having technological mentality is critical to obtaining what Prensky defines as digital wisdom. But whilst Prenksy believes everyone is capable of digital wisdom, but many choose not to acquire it, Ellul does not identify with this. For Ellul, the ideas and beliefs of the human kind have already been surrendered to the "technical milieu". Therefore, human beings are all subservient to the demands of technology and any attempt to deviate from this mindset is futile, "as modern man's state of mind is completely dominated by technical values and his goals are represented only by such progress and happiness as is to be achieved through technique" (Ellul 1964, p. 395).

However, Prensky's theory of digital wisdom is more relevant when we refer back to the data. The teachers did not identify with Ellul's belief that all human beings are no longer free to choose their orientation to the technique, because they believed that not everyone possesses a positive mindset towards technology. Therefore, the data is aligned with Prensky's core belief that not everyone is capable of becoming digitally wise and only those who see that the possibilities of technology lead to better outcomes in almost all fields of human endeavour "as a result of the emerging symbiosis of human mind and technology" (Prensky 2013, p.59). Prensky illustrates this by using the example of Steve Jobs, who used his digital wisdom to create a virtual store (iTunes) where people could purchase songs legally at a much-reduced price. This he believed, demonstrated how solutions are made possible when someone is digitally wise, because they understand how to use technology to his or her advantage (in Steve Jobs' case, to create a billion dollar solution to a legal problem of music sharing). As not everyone is capable of seeing technological solutions, as Jobs did, they are not open to the possibilities of technology; thus, they can never be digitally wise. Consequently, having a positive mindset towards technology is as much about facilitating ways of thinking about and working with technology and understanding technology broadly enough to apply it productively, as it is having the ability to adapt to changes in information technology (Koehler & Mishra, 2009).

Academic ability and technological experience have also been consistently identified as a significant factor to the success of online learning programs. For

example, Le *et al* (2018) found that competence was found to be a significant obstacle to effective collaboration. This was similar to research by Sanchez, Salinas, Contreras, Meyer, (2010) whose data showed evidence that learners with shared traits, such as academic ability and experience, are more able to exploit technology than those without. Certainly, the data on the adoption and use of technology have generally shown that a number of factors including, academic ability and previous experience with technology, can impact on the perceived benefits of technology. But this is not to suggest that people who do share these common traits are going to adopt technology in the same way and at the same pace, because that would align with the digital native concept. However, it does suggest that people who are digitally literate are more comfortable and at ease with technological processes, which is concurrent with the data from the interviews. Therefore, as a result of the fact that the teachers saw no distinct link between a student age and their technology adoption, we can conclude that attitudinal factors were more important to the teachers of Class X when it comes to successful online collaboration. When it comes to obtaining digital literacy, we might say, the adoption of new technology typically requires new learning, and learning is influenced by individual attitudes.

Digital literacy is generally described as being built on three principles: the skills and knowledge to use a variety of digital media software applications and hardware devices; the ability to critically understand digital media content and applications; and the knowledge and capacity to create with digital technology. Digital literacy is thought to represent one of the core skills of the “digital native”,

but it is not exclusive to it. In the context of this research, this is important. We know from the data that the teachers identified with the concept of digital literacy, but they did not identify with the idea that all young people are digitally native. However, the rhetoric around the “digital native” is as much about the digital habits and behaviours of young people as well as their technological skills. This brings me to reconsider Prensky’s digital native in a different relational construct, because although we know that Prensky describes Digital Natives as “native speakers of technology, fluent in the digital language of computers, video games, and the Internet”, he also aligned the concept of the digital native with the possession of a specific skill set, which included a particular digital language and set of behaviours towards technology (Prensky 2001a; 2001b, p.8). Therefore, Prensky believed that digital natives share a distinctly positive attitude towards technology, which he saw as a representation of a move towards digital enhancement. This suggests that, at the core, digital natives are primarily motivated to pursue technology to extend and enhance human activities, because they believe in the power of technology. Thus, the digital native is more acceptant of technological advance, because they have accepted that technology improves human processes, and accepted that technology has power over human beings. The data from this study did show that the teachers shared this view to some extent. Two of the key findings from the data – that digital literacy and previous experience with technology represents the greatest opportunity in collaboration – are aligned with Prensky’s idea of digital wisdom and the enhancement of the human brain. As we discussed, this bares some similarities to Ellul’s view that man has become a

slave to the demands of the technique as he is no longer free with respect to judgment and choice because of it. However, Prensky views this as a positive, whilst Ellul views this as a dangerous path. Therefore, in the next section of this analysis, we will explore this concept further, referring back to the philosophical arguments of Ellul and Heiddeger.

5.4 Key Finding (C): That Time, Speed Of Process And Choice Of Software Are Key Factors That Influence Successful Technology Use. The "Rocket Powered Student"

In his book, "*Teaching Digital Natives: Partnering for Learning*, Prensky spoke in depth about students, who in today's digital world, have become akin to rockets who operate faster than any generation that has come before. This he believed can be demonstrated by our increasing dependence on technological enhancements. This connects back to the idea that only people who have a particular mindset towards technology can accept digital enhancement and ultimately access the power of technology. This is because Prensky defines the relationship between human and machine as mutually beneficial, much as the teachers also inferred in the interviews. Consequently, Prensky sees the development of human beings to be intrinsically linked to the development of technology because he views technology as having the capacity to create digital wisdom. This he considered to be an expression of the way a person accesses the power of digital enhancements and in the way in which they use enhancements, to facilitate wiser decision making.

The outcome of this kind of argument from Prensky is two-fold. Firstly, it leads to the suggestion that technological change is arising independently, just as Ellul and Heidegger suggested. Secondly, it infers that the extent of a person's digital wisdom depends largely upon a person's attitude, particularly how they see technology and the world, and which technological enhancements they decide to accept. Therefore, this argument suggests that digital technology will become an essential support for human development and the "brains of those who interact with technology frequently will be restructured by that interaction" (Prensky 2009, p. 1). When we refer this back to the data, the concept of the human and machine relationship was important because the teachers strongly identified, just as Prensky had, that technology has a positive impact on collaborative practices and learning as a whole. Again, and similarly to Prensky, they discussed the notion of efficiency and innovation. This was particularly interesting, as it linked to Prensky's conjecture that people who only believe that knowledge resides in human beings, where it has formerly resided, will never be digitally wise. So in essence, human beings have limited capacity without technology, whilst human beings with technology have an unlimited potential.

The problem with this assertion, for philosophers such as Heidegger and Ellul is that this view is informed by our instrumental conception of what technology is, rather than providing for a fuller understanding of how humanity stands in relation to technology. This is significant for the discussion because an

instrumental view of technology, such as Prensky's vision of the rocket powered student, views that all human experience is shaped by the tools and systems that we use. Therefore Prensky's belief, much in the same way as the teachers of Class X, is that the use of technology is purposeful, as technology is deemed as a neutral object. This is a problem for people interested in the technology itself, because the technology or the essence of technology cannot be focused on without studying technology in context. In his pursuit of more fundamental meanings, Heidegger discussed the idea of bringing forth in terms of revealing or "aletheia" which he likened to a state of mind which he believed was essential in order to prepare us for a free relationship to technology. Heidegger asserted that without "aletheia", the degradation of man – "being to the level of mere objects" – will follow. Heidegger thus believed that technology constitutes a new type of cultural system that restructures the entire social world as an object of control (Heidegger, 1977, p.7).

Ellul (1994) also cautioned that taking an instrumental view of technology is dangerous, because technology emerges as single dominant way of answering all questions concerning human action and human knowledge. This approach shifts the emphasis to social groups, with less importance on technology. This leads to a mechanistic perspective, in which technology is fully controlled by society. Furthermore, whilst Ellul concurred with Prensky that technological change is arising independently, he also believed it subjugates our humanity. Consequently, both Heidegger and Ellul regard modern technology as a great danger for humanity as we fail to recognise the primacy that is attributed to

technology. As Heidegger observed, "The will to mastery becomes all the more urgent the more technology threatens to slip from human control" (Heidegger 1977, p. 289). This brings us to consider the next key finding, that time, speed of process and choice of software are key factors that influence successful online collaboration as this is closely aligned to Ellul's "technique" "which he conceived to include the whole complex of rationally ordered methods for making any human activity more efficient.

5.5 Key Finding (D): That Time, Speed Of Process And Choice Of Software Are Key Factors That Influence Successful Technology Use … "Homo Sapiens Digital"

The teachers of Class X believed that human progress is driven by technological innovation, as seen by the statements which discussed how the shift in balance towards the technology and away from face-to-face environments would be more beneficial to today's students. One way of interpreting this is to say that the teachers are following the assumptions of the "inevitable" course of technology that, as we saw in the literature review, was a key notion for Prensky and Ellul. I found thinking about this concept very interesting for two reasons. Firstly, that the teachers of Class X believed that students who have been exposed to digital and networked technologies are more successful online collaborators and, secondly, that this success is attributed to the technology, and not to the interaction with any human subjects. This is strongly aligned with Prensky's claim that digital enhancement has to be

accepted in order to succeed, but also that when it comes to technology, that human choice has been diminished.

I make this claim because there was much to suggest within the data that teachers' perceptions of successful online collaboration were as much related to how long it would take a student to adopt technology in terms of speed and ease of process as it were about their attitude to technology. While it can be argued that the two are invariably connected, because both are closely related to Prensky's digital wisdom, the data suggested that the teachers valued the speed that technology affords above all else. This has been described as the Promethean faith in the intrinsic power of technology, a concept which Ellul believed has evolved as a result of the common perception of progress – one that precedes the use of technology. This is because we have come to see that the possibilities of human survival are better served by the "technique". Seen in this light, technology is essential because it grants a perspective through which humans are able to control and effectively use technology as a tool for use and exploitation. However, the value of technology from this perspective primarily focuses on the efficiency of technology and not upon human purpose. This is why Ellul holds that man is rendered incapable of giving direction to technology, because he is not the subject of it. Therefore, Ellul views the concept of efficiency as a negative consequence of our objectivity with technology. Mankind is not the master of technology, technology is the master of mankind.

Consequently, there is conjecture that the notion of the faith humankind has in the power and efficiency of technology effectively distances itself from a subjective view of technology itself. When we consider this against the interview data, it does appear at least to support this idea as the teachers spoke of technology as if there was no choice other then to accept it. This leads me to question if this affected the way they looked at online collaboration because, if they were of the opinion that technology is a necessity, they would also be unlikely to look at technology subjectively. From the perspective of the literature that concerns successful online collaboration, we know that it is just as important, if not more important, that teachers to have a positive attitude towards technology (Scardamelia and Bereiter, 1991; Lowry, Roberts, Romano, Cheney, and Hightower, 2006). Perhaps, this is what we are seeing evidenced in this study.

So in one sense what I want to suggest is that the teachers' perceptions of online learning are predominantly based on their faith in technology, because they view that the use of technology makes learning, and indeed most things, more efficient. This may serve as one explanation as to why they saw that a students' technological ability was so important to online collaboration, as a person who has faith in technology will be more positive about the opportunities online collaboration offers. This is not to say that the teachers believed in the rhetoric that surrounds the phenomenon of the "digital native" – which views them as being in some way "wired differently" from their predecessors as a result of their exposure to digital technologies. However, it does suggest they

believed that the adoption of technology in learning contexts is critical and necessary, because technology is progress. This is aligned with Ellul's theory of our entrenchment in the forms of technology, which he considered represented speed and time. A person who sees nothing in the future other than technological trends is more likely to embrace anything which speeds up human processes. Thus, if our desire for speed has overwhelmed all else, will this mark the death of the professor as Lyotard (1994) famously and controversially predicted. The reality is no one really knows. We do not know, for example what education might look like. Thus, we do not know what the role of the teacher will become, or indeed, if it becomes anything different at all.

Therefore, we are potentially looking at this study from somewhere in between the hardline of Prensky's original concept of the digital native and his more recent conjecture of digital wisdom. When we think back to the data and to my belief that teachers' perceptions of online learning were predominantly based on their faith in technology, it suggests that the concept of digital wisdom ought to be explored more thoroughly. This is because Prensky's digital wisdom is aligned with the experience with technology. And we know the teachers believed that technology represented an opportunity in collaboration. The concept of Prensky's "homo sapiens digital" (the term he used to describe the digitally wise) is thus perhaps more relevant to the findings of this research as opposed to the concept of the "digital native", because digital wisdom is concerned with the belief that human capabilities will be enhanced because of technology. This is opposed to the concept of the "digital native", who is thought

to have digital capabilities and preferences because they have never know anything other than the digital world.

The teachers of Class X did not identify with the idea that all young people had the similar preferences and learning behaviours found in Prensky's digital native, but they did believe that students who had more experience with technology had more positive expectations of the power of technology. It was also relevant that the teachers also had a positive mindset towards technology which, as we have argued, is linked to successful online collaboration (Scardamelia and Bereiter 1991; Bullen 2008, Lowry 2006). This fits well with Prensky's hypothesis that the enhanced brain of the homo sapiens digital is more sophisticated because of digital technology, whilst the un-enhanced brain one considered to be "well on it's way to becoming insufficient for truly wise decision making" (Prensky 2009, p. 3). Consequently, Prensky projects that students who have digital wisdom are more advantaged because they can "intelligently combine their innate capacities with their digital enhancements" (Prensky 2009, p. 3). But the key point here is that anyone can achieve digital wisdom, because it is defined by experience with technology and the enhancement of the mind through digital technology. This is similar to the views of the teachers, who suggested that students who had a strong academic base and experience with technology would be more successful in online collaborative learning contexts. Therefore, the teachers concurred with Prensky that there was a correlation between a person's innate capacities and their ability to use technology productively. In fact, Prensky also suggested, as did

the teachers, that this is also connected to a person's ability to filter information and decide what is useful and what is not. Consequently, a person with digital wisdom is not just a user of technology – they take care to consider why, how and when to use it. This is because they are able to question if the use of technology is wise, and, if there are any wiser uses of the technology, which Presnky considered to be indicative of a digitally wise person. For Prensky, it is the combined answers to the questions that digitally wise people ask of all technologies that constitutes digital wisdom and not just an acceptance of technology for technologies sake. Thinking back to the data, this appears to be quite relevant. The teachers spoke of how more academic students were more accustomed to using technology in a certain way and the same students were not satisfied with the first answer given to them. They also spoke of how the majority of students use technology for social media and not for what they considered productive use. This refers back to Prensky's belief that digital wisdom is a dual concept, because it refers to the wisdom arising from the use of digital technology and to wisdom in the prudent use of such technology.

However, this takes me back to one critical point. Prensky's homo sapiens digital is still conjectured on the basis of broad assumptions about the use of technologies, which is similar to the views of the teachers. However, the majority of evidence has shown that despite this conjecture, students' high levels of use and skill with technology does not necessarily translate into preferences for increased use of technology in the classroom (McWilliam, 2002; Hargittai, 2010). Consequently, we are still thinking about people as having

particular technological preferences on the basis that technology is equated with progress. However, as we have discussed, it can be problematic when it comes to applying this assumption to education. If we take the broad stance about technology Prensky suggests, we are taking what Ellul believed was a standpoint from our culture. This is because, according to Ellul, whether with nature or technology, humans succumb to the powers that govern their destiny. As Ellul believed, a technological society is not one of machines, but of techniques. For Ellul, what holds a society together is whatever forms of power man believes governs their society and destiny.

I had argued that this sense of faith in technology was also present in the teachers and this, from Ellul's point of view, would represent that the teachers share the view that technology is sacred. He argued that technology had replaced nature as our all-encompassing environment and filled us with a sense of utopian hope, because of the pleasures and abundance that technology promises. Therefore whatever is sacred within a culture is given absolute value and as a sacred value. It cannot be called into question or criticised. Thinking back towards some of the key statements in the interviews, such as the view that we should be "*handing over more and more of what happens in our world to the speed and efficiency of the computer*", and that technology is "*the ultimate tool",* which "*will outperform a human being at every turn",* there was certainly a feel within the data that the teachers saw no other direction for learning and teaching other than one which values technology as a driving force. For Ellul, these beliefs would be evidence enough that humans are

placing all their hope in a technical society on the basis of the popular distortion of a technological utopia. This, for Ellul, results in the adaptation of human beings to the technical milieu. This renders man happily subordinate to their new environment. Thus, it seals our fate, because technology is self-determinative and independent of all human intervention. Consequently, it is this assumption that causes me to suggest that the teachers offer no protest to what Ellul considered as the efficiency of the technique. Or in other words, there is nothing more important than the pursuit of technology.

Therefore, one could argue that time, speed of process and choice of software are key factors that influence successful technology use, (key finding c), are all based on the same principle of efficiency, because the teachers all identify with Ellul's description of the sacral world of technique. Furthermore, they offer no protest against the efficiency of technique, believing that technology will be the "*cause of change in both learning outcomes and teaching efficiency".* This brings me to consider how this concept of efficiency fits with the teacher's perceptions that, as a result of a student's digital wisdom, their role will become more peripheral. This is because efficient pedagogical models are most associated with virtual teaching methodologies, and not classroom based models like Class X. This is based on the principle that the more digital wisdom a student has, the more autonomous they become and the more autonomous they become, thus the more capable they are to self-organise, to self regulate and to self determine their own learning paths through the medium of technology

When we seek efficiency in every human activity, it has been surmised that this defines our society as one that is governed and controlled by “techniques”. This is because we have come to view technology as sacred, and what is sacred we engage with, in order to bring ourselves into harmony with its demands. Therefore, when humankind meet the demands of the technique, they become controlled by it; thus, humankind becomes world-less and looses his here and now. Postman believed this represented a "totalitarian technocracy", which demands the "submission of all forms of cultural life to the sovereignty of technique and technology” (Postman, 1995, p. 71-72). This echoes Ellul’s conceptualisation of technology as autonomous and self-determinative and is exemplified in Postman’s view of the computer. For Postman, the computer has established its sovereignty over all areas of human experience, based on the claim that it "'thinks' better than we can. This has resulted in our endless pursuit of technology as “the tools of technology are biding to *become* the culture” (Postman 1995, p.22).

Consequently, in the age of the internet and as technology becomes more sophisticated, what we call "wisdom" will reach new levels as a result of our changing relationship with technology. Some of that evolution will result in us seeking and finding meaning in machines and technique, rather than human subjects and this is the position the teachers of Class X are taking. Their view is that knowledge can be acquired without the presence of a teacher, as groups of children can learn almost anything by themselves when given internet access

and the ability to work collaboratively. For the teachers this represents an opportunity for online collaboration, as students will not longer "*manipulate the time of the teacher".* Therefore, this arguably comes back to the idea that the teachers value the efficiency that technology makes possible, both for the students and themselves. This was articulated in the statement, "*the machine can already do the tasks teachers did, but they can do it faster and better",* which suggests they believe, as Prensky does, that technology can and will surpass the human brain. However, this also suggests that if the teachers do not believe in the "man is special" fallacy Prensky spoke of because they believe technology is a more efficient way of learning and teaching. Arguably, then, the view here is that technology will eventually negate the need for teachers, because technology is more efficient. Whilst the teachers of Class X did not suggest this, there was at least some conjecture from them that the role of teaching will be "*outperformed*" by the machine. Coupled with the statements in which they referred to themselves as "*facilitators*" who are not "*robotic*", but that "*robots maybe part of that facilitation"*, this further suggested that they saw technology as having a significant influence upon teaching in the future. So when we refer back to the research question, "what do teachers see as opportunities in online collaboration?" it seems reasonably clear that the technology, or, more specifically, the efficiency of technology, represents the most significant opportunity for successful online collaboration.

This, Ellul would likely argue, is the consequence of accepting the demands of efficiency, which from his viewpoint is naive, being based only upon the

ideology of technical utopianism. In terms of the online data, this viewpoint could be supported. When we consider the online dialogues, which consisted of three discussions spanning over two terms, there were only two examples of students engaging in anything other than what can broadly termed as expressive speech acts. These were categorised as messages that generally occurred when a student expressed his or her psychological state to the other students or the teacher, the most common examples being thanking, apologising, congratulating or greeting. Furthermore, out of all the examples of directive speech acts, there were only two examples that were generated from the students. These were broadly constructed as sets of instructions or requests. In addition, there was no clear evidence, with the exception of two directive speech acts, that the interactivity from the students in these discussions were applicable to learning, because on the whole they had a social context. So whilst, the hypothesis of Class X is centred around the belief that, given the right technological environment and the “ideal” students, online collaboration will be successful because of technology, the data I had access to suggested differently. Moreover, it suggested in some ways that the students used the online platform for social purposes rather than learning ones.

From a research point of view this was not surprising, because the net generation are accredited with primarily using technology for personal empowerment and entertainment. This is in stark contrast to Prensky’s portrayal of the digital native, and indeed his concept of the homo sapiens digital, which equates non-technology-based thought and exploration as

digitally unwise. However, it did not explain why the teachers perceived that their role was somehow superfluous to students when they are collaborating online in a learning context, because, in reality, the data suggested the opposite. It certainly appeared that in the three discussions I had access to it was unlikely that the conversation would have continued at all without a teacher presence. I make that broad assumption on the basis that the students had to be frequently engaged to join in the discussion by the teacher, with the use of directive speech acts. The data also showed that the students made only two uses of directive speech acts themselves and one would expect to have been much higher. This is because directive speech acts are perceived to be common in online posts, especially in the initial post of each thread when the originator requests help or advice regarding a specific topic. In addition, the frequency of expressive speech acts are far more commonly linked to social media and less commonly to online learning contexts. For example, it has been hypothesised that expressive speech acts should be at the most very low-profiled and, most likely, non-existent, especially when there is a conspicuous presence of the teacher. This, it is believed, adds to the institutional nature of the interaction. Undoubtedly, when we refer back to the research question, “how is participation patterned between the teacher and the students in an online discussion?” it seemed reasonable to assert that the conversation was reminiscent of a traditional classroom structure where the teacher was the instructional force and not, as the teachers suggested, a facilitator to the process of learning and superfluous to the needs of the students. Whilst, I am conscious that there are many reasons why the use of speech acts in these

three discussions were configured as they were, one stands out to me, particularly in terms of comparing this with the other research questions, namely, the way we have come to regard our relationship with technology. If, as we have argued, the teachers hold technology in such high esteem that they are unable to see any other world other than the one which values the interaction of minds with the interaction with machines, it seems likely they would view their relationship with teaching and learning as different, because of the mediation of technology.

At this point though, we should be reminded that Class X is considered to be aligned with Mitra's self-organising environment or SOLE. This, then, may be a further factor contributing to the ways the teachers were perceiving and reflecting on the structures of the online collaboration. The SOLE is built on the principle that it appeals to the "digitally literate" because it supports forms of socially augmented learning that is thought to be ideally situated to approximate the conditions for "authentic" learner participation. Class X claims that by developing these communities of self-organised learners, students will develop a higher than average ability to learn with independence, which increase the autonomous behaviours of the students through technology. Therefore, within Class X, the role of the teacher should be more "minimally invasive" because it has been suggested that enabling students to become self-organised at learning cannot be achieved through instruction (Harri-Augstein and Thomas, 1991). This supports the view that the teacher's place within learning environments, such as Class X, is more "distant party" than instructional force.

To some extent the data from the online discussions concurred with this, because, from one perspective, there was “minimal instruction” from the teacher. In addition, when we remember that we had also conjectured that Class X is closely replicable to Siemen’s connectivism, the level of interaction between human subjects would be diminished, as Siemens perceived that interaction is thought not to be limited to human beings. This means that learning may reside in non-human appliances, such as computers. This provides some explanation as to why there was less, in the way of quantifiable data, to analyse (Siemens 2004). This is partially because, within the theory of connectivism, there is an implication that the technology itself serves as a proxy tutor. In learning situations this may impact on the types of interactions one could expect to see when analysing online discussions. If we refer back to MOOC learning contexts, which I considered to be the closest replicable environment to Class X, the teacher’s role was likened to the distant ‘rock star’ or ‘academic celebrity’ lecturer, the co-participant or facilitator within a network, and the automated teacher (Bayne and Ross, 2014). Therefore, if Class X is indeed going the route of the MOOC pedagogy, you would expect the teachers to have identified with the conjecture that their role was not the same as a more traditional instructional environment, which was exactly what the data from the interviews suggested. From this point of view, the data from the online discussions did show that the teacher’s role was minimally instructional, because the limited amount of messages in itself within the three discussions point to the suggestion that students were to some extent exploring information

independently. Therefore, whilst we cannot assume this was the case, it certainly seemed plausible that when teachers, who were strong advocators of technology, taught students of a similar belief within a technological environment, they were more likely to identify with the MOOC pedagogy.

However, as was discussed in the literature review, the principle of the “minimal involvement” teaching position is much contested and particularly within face-to-face environments like Class X. Salmon (2000) believed this is connected to the conjecture that the teachers see their role differently to how they do in a traditional classroom when the teaching environment is technologically supported. However, her research showed that they were still important to children’s learning. Similarly, Swan (2001) found that online discussions, where teachers interacted with their students frequently, were more likely to encourage online collaboration between all parties. This certainly appeared to be the case with this case study. This also appeared to connect to the findings of Scardamalia and Bereiter (1991), who described the frequent over estimation we have about young people’s ability to construct their own knowledge because the use of technology was akin to “dangerously romantic optimism” (Scardamalia and Bereiter 1991, p. 37). This is because they believed that, in learning contexts, the role of the teacher was critical. Therefore the teacher should not be underestimated as knowledge is “dependent on more rather than less intense involvement of the teacher” (Scardamalia and Bereiter, 1991, p. 39). Indeed, the feeling of optimism I had sensed from the teachers in the interviews lead me to believe that it was their faith in technology, above all

else, that lead them to believe that technology itself was the most important factor to successful collaboration. So, whilst the teachers believed that experience with technology enabled students to collaborate online more easily, and that the lack of belief in technology and lack of experience with technology in learning contexts presented the most difficulties for students with online collaboration, this again steered me in the direction of thinking about faith in technology as an overarching theme. At this point, I became sure that the faith in technology was the concept that connected both research questions.

From this point of view, perhaps the perceptions of the teachers were an example of the “romantic optimism” Scardamalia and Bereiter had spoken of (Scardamalia and Bereiter 1991, p. 37). With certainty, the idea of the over estimation of technology has been a recurring theme in discussions focused on how the net generation will be learning in the future. However, from another point of view, it has been suggested that new pedagogies such as Class X, can be promoted by the social presence of teachers. This is because students who are able to organise their learning with a high level of self-direction are less reliant on a teacher. If we refer this back to the interview data, this was conveyed by the teachers, as they believed students who were more academic and technologically minded manipulated less time off the teacher. Consequently, when we think about the research question, “how is participation patterned between the students and the teachers in an online discussion?” it would be tempting to look at the data in isolation and come to the conclusion, as I did, that the teachers were critical to the discussion, and not, as they

suggested, peripheral. However, when we see the data alongside the other two research questions, it seems plausible that the opportunities that arose from having a positive mindset towards technology, against the difficulties that arise from having a negative mindset towards technology, would lead a person to be optimistic when it comes to thinking about technology. This would explain why the teachers believed that technology will change learning and teaching as a whole.

This faith in technology refers back to the concept of Prensky's homo sapiens digital, particularly when we connect this to how new forms of learning practice potentially changes young people's behaviours, as a result of their growing digital wisdom. This may explain to some extent why the majority of the responses from the students were expressive speech acts, because people with digital wisdom are considered to be immersed with technology, so much so that their normative modes of communication may have altered. We know that there has been some support for this argument. Heap (1985) for example, showed that teachers and students can be jointly engaged in establishing the meaning and significance of text. Therefore, whilst there is help from the teacher in forming answers, which was indicative of this study, the children may not be responsive because they should be expected to grow into these competencies. This suggests that asking good questions, which would have been evidenced as directive speech acts in the online discussions, is a skill that students need to learn in order to participate.

Furthermore, the study revealed that students interacted on the online discussions in a mainly social way, which was demonstrated with the use of expressive speech acts. Whilst this initially seemed unusual, given what the teachers had inferred, we could also look at this in another way. Aristotle asserted that basic sociality must be properly nurtured and habituated in order to reach the full expression of what we might call sociality in thought and behaviour. This reasons that something needs to be learnt with regards to social action. So, whilst Aristotle asserted that, under normal conditions, human beings are fundamentally oriented to others, he also argued that we initially seek reciprocity, because humans are naturally predisposed to social give and take.

Aristotle saw this as being a three-stage process. The first stage is the reciprocal sharing of good that acts as the glue of all friendship. The second is an exchange of utility. The third he considers the most perfect friendship or the “complete” friendship. In this third friendship, the exchange is not merely one of transient goods, but is one of enduring respect, love, knowledge and virtue. Therefore, Aristotle saw that the “complete” level of reciprocity constitutes a mature and habituated virtue between complete friends. Aristotle has relevance to this study for two main reasons. The first, in giving critical substance to the idea that there is something that needs to be learnt in order for students to engage more freely within online discussions. The second is that his work helps to show that social interactions are initially oriented by reciprocity. If this is the case, the students of Class X may not have reached Aristotle’s perfect

friendship and thus would be unlikely to converse in the way we initially expected them to. I know from the pre-visits that the students only started Class X in the September. Therefore, the discussions I had access to did not provide the whole picture in terms of looking at the Class X discussions across a full school year. Consequently, it is highly likely they had neither had much time to form strong friendships, nor be capable, as Heap (1985) suggested, to be confident or competent enough to ask the good questions I was looking for.

We need also to reconsider the environment the students and teachers were situated in. As Vallor (2011) argued, one of the distinguishing features of Web 2.0 technology is their ability to facilitate reciprocal exchanges of a socially gratifying sort. This, she asserted, could be demonstrated with social media applications, which primarily provides the opportunity to use third-party applications to engage in a wide range of reciprocal activities, none of which require the heavy social investment that, as Aristotle asserted, was necessary to achieve “complete friendship”. When we consider the data from the online discussions against this assertion, it does offer an alternative explanation as to why most of the students’ exchanges within the discussion were primarily social exchanges (even Aristotle recognised that “complete” friendships of virtue are intrinsically rarer than those of pleasure and utility). In addition, evidence of reciprocal bonding on Aristotle’s level of virtue would be expected to be rarer online as well, because, as many researchers have asserted, learning in a MOOC may be experienced qualitatively differently to a face to face classroom, particularly in terms of supporting relational configurations.

Compared to face-to-face learning environments, online learning has been criticised as lacking social presence and this has been especially felt in asynchronous learning environments. In fact, it has been argued that these put learners at a disadvantage due to physical separation, lack of synchronicity in communication, and text-based nature of the communication (Johnson and Aragorn, 2003; Sung and Mayer, 2012). This is considered to be because teaching and learning are inherently social endeavours. Therefore, when we change the temporal and psychological distance between instructors and participants, there is bound to be an effect. It has been claimed, for example, that within asynchronous learning environments, discussions are designated to be the main context for student-to-student interaction and, therefore, perceptions of connectedness with others can influence students' participation. This was exemplified in a study by Lowry, Roberts, Romano, Cheney, and Hightower (2006) that compared the key communication factors of face-to-face with computer-mediated communication. The results indicated that only smaller groups of students were able to establish and maintain higher levels of communication. In addition, face-to-face communication supported higher levels of communication quality, when compared with online communication. This supports the idea that when students are engaged in online learning environments, they are less engaged in higher-order thinking and therefore produce fewer dialogues, ask fewer questions, and the discussions are repetitive (Lowry, Roberts, Romano, Cheney, and Hightower, 2006). This certainly fits with the data from Class X, as the students' predominant use of

expressive acts indicated. Furthermore, only two examples of directive speech acts were identified as originating from the students. This also fits with Lowry *et al's* findings that students in online discussions ask fewer questions when compared to face-to-face environments.

When we consider the initial inference that technology supports a new relational configuration between teacher and student, we should also consider that it also appears to support a new relational configuration between student and student. Consequently, we arrive back to my original assertion that the technology itself is assuming power, because it does appear to affect the way we communicate and does gravitate us towards exchanges of a socially gratifying sort.

As we asserted, though, there are many examples of opposing research that suggests that technology, in and of itself, does not directly change teaching or learning at all (Salmon 2000; Scardamalia and Bereiter 1991). When we refer back to Aristotle's assertion that basic sociality must be properly nurtured and habituated in order to reach the full expression of thought and behaviour in sociality, this suggests that the idea that students will work together because they are "digitally wise" and not because of any interjection with a teacher does seem optimistic as Swan stated (Swan 2001, p. 13). The literature seems to be in agreement, that although online teaching is different from face-to-face teaching and the teachers role maybe different, there is little that concurs with the view that teachers are not necessary to the production of productive dialogue or ultimately, learning. This also suggests that presence of technology

in a learning environment such as Class X does not equate to a “minimal involvement” from the teacher, but they are potentially “minimally instructive”, on the basis that the teachers approach digital learning with a mindset associated with “digital wisdom”.

When we refer to research on facilitating collaboration in online learning this does seem relevant, because the attitudes of teachers towards technology is a significant variable in online collaboration, as was considered to be the case with this study. Looking again at the data, we know that the teachers of Class X were enthusiastic about the potentiality of technology in educational fields. In fact, I had asserted that the research questions “what do teachers see as opportunities in online collaboration?” and “what do teachers see as difficulties in online collaboration?” were both discussed in reference to the students having a positive mindset towards technology. This, they believed, was connected to their experience with technology and their academic ability. However, as I also suggested, that this mindset seemed to be an important characteristic for teachers and students alike. I believed this connected to Prensky’s description of the enhanced human or homo sapiens digital. This is because the homo sapiens digital is premised on the belief that a person who accepts digital enhancement as an integral fact of human existence “both in the considered way he or she accesses the power of digital enhancements to complement innate abilities and in the way in which he or she uses enhancements to facilitate wiser decision making” (Prensky 2001, p. 20) will ultimately find online collaboration easier, because they share the belief that

technology will improve human activity. Therefore, in terms of the first two research questions, it was ultimately the faith in technology that enabled students to collaborate online more successfully, whereas having the least faith in technology presented the students with the most difficulty, collaborating online.

Taking a philosophical point of view, the research questions revealed something quite important about how we have come to view technology. If faith in technology is considered so critical it seems likely that, as we accept it, we will ultimately succumb to the demands technology places on us. This brings me to question, where will this stop? Is every human process and activity destined to be considered with technology? For Ellul and Postman and, to some extent, Heidegger, this is our current reality, because the “homo sapiens digital” has come to view technology as sacred. To some extent, we could argue that this view in which technology is given the ultimate value was shared by the teachers, as they did not see a future without it. In fact it would seem likely that, a person with a positive mindset towards technology would find a reason to reject every non technological solution that might present itself in favour of a technological solution because any faith or belief equates to confidence, which is based on some perceived degree of warrant.

Chapter 6: Conclusion

6.1 Summary of Findings

This was an exploratory case study with a small sample size; its purpose being to examine the teachers' perceptions about online collaborative dialogue in a self-organised learning environment called Class X, which delivers an online version of the provincial curriculum in Ontario within a face-to-face environment. The research sought to contribute to the tradition of work that focused on two recurrent assumptions in the literature. The first, that education is neither equipped to support the technological skills and learning preferences of young people, nor does it recognise the potential technology has to support education programs that expose young people to the implications of online learning. The second, that increasing technology in the classroom to create new forms of learning using collaborative learning techniques will result in the teacher's role becoming more peripheral, because technology serves as a proxy tutor.

The study aimed, through the research questions, "What do teachers see as opportunities in online collaboration?", "What do teachers see as difficulties in online collaboration?" and "How is participation patterned between teachers and students in online discussions?" to seek out and present multiple perspectives of the activities and issues around teaching within an online learning environment.

The following general conclusions based on the teachers' perceptions of online collaborative dialogue were revealed:

a) That teachers believe that online collaborative dialogue is more successful with students who have a positive mindset towards technology. Consequently this presents the most opportunity for collaboration between students in online discussions.
b) That teachers believe that online collaboration is less successful with students who are less experienced with technology and less open to the potential of technology. This presents the most difficulties for collaboration between students in online discussions.
c) That these perceptions are primarily linked to the positive beliefs of the teachers about technology.
d) That the pattern of participation between the students and teachers suggests that teachers are critical to the process of online collaborative discussion, which is not dependent on either their positive nor their negative attitudes to technology.

The first finding, that teachers believe that online collaborative dialogue is more successful with students who have a positive mindset towards technology showed that teachers' reflections on online collaborative learning are often guided by the challenges of managing students' attitudinal characteristics and dispositions towards technology. This has been highlighted as a significant factor to the success of online learning projects and is particularly interesting

when we refer back to the literature review and the comparisons with Siemens' connectivism.

Siemens (2006) maintained that learning begins with the individual and occurs when knowledge is actuated by learners connecting to, and participating within, a learning community. Siemens defines a community as the clustering of similar areas of interest that allows for interaction, sharing, dialoguing and thinking together and in the context of the findings from this research this seems relevant. The teachers believed that their careful selection process would enable similarly motivated students, who all shared technological and academic interest and ability, to collaborate. This was because they believed this presented the most opportunities for students to collaborate in online discussions. Therefore, what the teachers are saying is that online collaboration is more successful when people with similar attitudinal characteristics are networked, and this is far from an technological deterministic claim as some might suggest when first reading this study. For example, there are many examples of research which have shown that students who have the strong feelings of community, such as Siemens spoke of, have been able to increase both the flow of information between each other and increase their commitment to defined group goals (Bruffee, 1993; Wellman, 1999). This is because the core value of being in a learning community whose members share similar attitudes means that students can locate their learning more easily, as one person's individual knowledge can serve as a resource for other peoples' learning (Scardamalia and Bereiter, 1994).

The second finding, that teachers believe that students who are less experienced and less open to the potential of technology present the most difficulties in terms of their ability to collaborate within online discussions, shares some parity with Prensky's concept of digital wisdom, particularly as Prensky believes that people who are not acceptant of technology have "un-enhanced brains" (Prensky, 2009). At the core, Prensky believes that although everyone can achieve digital wisdom, they have to acquire it. Therefore, those who are not open to technology will not ever be able to fully grasp its possibilities, which limits their potential in terms of progression. Consequently, Prensky projects that students who have less digital wisdom are disadvantaged, because they cannot "intelligently combine their innate capacities with their digital enhancements", which is similar to the findings of this research (Prensky 2009, p. 3). Therefore, the second finding implies that the teachers identified with Prensky's core belief on digital wisdom, that the extent of our knowledge with technology largely depends on our attitude and how we choose to see technology in the context of the world.

This vision of technology, which holds that technology is a necessary tool for human manipulation, is known as the instrumental view of technology. This means that technology is a neutral instrument that can be put to good use or bad use by whoever yields it. Therefore, from the teacher's perspective, technology is a bare physical structure and this is important when we refer back to the philosophies of Heiddger and Ellul. As their perceptions are aligned with

an instrumental view of technology, they are conjectured on the basis that technology is a means to an end; a tool to be manipulated by the user. From this point of view, a person who resists technology and does not see the benefits in wielding the tools of technology will ultimately become isolated or rejected in society, because they do not identify with the belief that technology makes human activities and processes better and more efficient. So, in the case of this study, online collaboration is considered to be more problematic and challenging because there is resistance to technology.

The third finding, that the teachers' perceptions are primarily linked to their own positive beliefs about technology is interpreted on the basis that the findings supported this idea as, arguably, this was the one factor that appeared to influence their views as a whole. For example, the teachers' beliefs regarding students' use of technology demonstrates their perceived value for technology, which I had argued was akin to having a sense of faith in it. This faith was present when I considered both of the research questions, "What do teachers see as opportunities in online collaboration?" and "What do teachers see as difficulties in online collaboration?" and also fits with the idea that the teacher's viewed technology from an instrumental point of view. There are many studies that would support this. For example, Niederhauser and Stoddart (2001) suggested that there was a connection between a teachers' pedagogical and epistemological beliefs and their view of technology. This was also exemplified in many other studies that have looked specifically at the connection between teacher beliefs and their influence on technology use in the classroom. From

this perspective, we would expect the teachers' views about online collaborative dialogue to reflect their own personal and particular views about technology.

The fourth finding, that the pattern of participation between the students and teachers implied that teachers were critical to the process of online collaborative discussion is, from Heidegger's viewpoint, important, because although he believed that the instrumental view of technology is correct, he believed that taking this view does not capture the complex relationship between human and technology: "modern technology too is a mean to an end. That is why the instrumental conception of technology conditions every attempt to bring man into the right relation to technology" (Heidegger, 1977, p. 5).

The suggestion that teachers were critical to the process of online collaboration, and that the success of online collaboration was not dependent on the student's positive or negative attitudes to technology, suggested that technology itself has not (as yet) altered the relationship between the student and the teacher. Such a view is well supported by the existing literature. For example, similar views are expressed by Salmon (2000) and Scardamalia and Bereiter (1991). Both support the idea that the teacher's place within learning environments, such as Class X, maybe perceived differently by the teachers and the students, but that in practice they are on the whole similar and comparable to traditional instructional school environments. Furthermore, when we refer back to Bayne and Ross' (2014) review of MOOC learning contexts, the teacher's role was considered to be varied from school to school, but nonetheless important to the

students. Therefore, I would argue that what we are potentially seeing in the fourth finding is an example of what Ellul referred to as the reinforcement of the system of techniques. This is where the teachers of Class X have come to see the possibilities of human survival as being better served by technology. This results in their perceptions about online collaboration being driven by their mindset towards technology. So when they start thinking about online discussions and their role within it, they see only technical solutions and not human ones. When there is a reinforcement of the system of techniques present, it is only, they believe, by means of technology that problems can be solved.

This leads to one overarching consideration. That within this study, there was a sense that the teachers' perceptions were atypical of an instrumental view of technology. This may explain why they did not perceive their role within online collaborative dialogue was the same as a more traditional instructional environment, because they viewed that technology altered the way children gained knowledge and communicated. However, as I have suggested, the teachers' perceptions of what created the most opportunities for online collaboration and what created the most difficulties for online collaboration (research questions one and two), demonstrated that they did not consider their role to be as important as the technology itself. Therefore, from this perspective, they would have been unlikely to look at technology from either Ellul's or Heidegger's viewpoint, which considered that technology was not neutral or that technology was rarely neutral in its effects.

One of Heidegger's greatest concerns about technology was that human existence is open to being distorted and submerged when technology becomes implicated in every dimension of our lives. Given the ubiquity of technology, Heidegger argued that technology itself demands our response and attention: we must realise that there is more to technology, and indeed the world, than the technological viewpoint. When it comes to thinking about technology there can be a tendency, as was shown in the findings of this research, to think only of the perceived benefits and opportunities of technology and not, as Heidegger and Ellul suggested, to understand the possibilities that technology both opens up and closes down for human existence. In fact, for Heidegger, we are actually at risk of losing ourselves to technology as we become more inclined towards the instrumental view – but there is still a way out. Ellul, on the other hand, believes the character of technology renders it independent of man himself. Therefore, whilst Heidegger remained hopeful that humans can seek out and strive for human agency, Ellul presents a more fatalistic view of technology as he believes at present we have no counterbalance to technology and have all but accepted an "application of technique to all spheres of life" (Ellul, 1964, p. 80).

In some ways this may be a fair assumption about what the story about online collaboration from the perspectives of the teachers in this study is telling us. The "faith" in technology which belongs to the teachers of Class X essentially serves to characterise their world and their world is one in which technology is the future. Ellul laments this as the rise of the economic man who values all

activities that are more efficient and devalues all activities and tendencies other than the economic. Therefore, for Ellul, this results in decisions being made without deep thought, from what is technically possible to its actuation. If we refer this back to the concept of Class X, that students will effectively be able to transfer their academic and technological skills into an ability to converse in online collaborative dialogue with minimal instruction, this does seem to align. It was reasonably evident that the teachers, at that moment in time, saw no counterbalance to Ellul's technique.

Thus the teachers are believers who have taken what Prensky would term the path of least resistance. They have accepted that technology makes human processes more efficient and thus better. Furthermore, their perceptions are guided by the idea that there is a distinct category of people who have a technological mindset and find it logical that technology will affect the way in which we communicate, especially if communication technologies start to become more mainstream practice in the classroom. Whatever the case maybe and however comfortable with, or discomfited we are, by the idea of this new technology permeating the classroom, it seems plausible that it is a conversation that is going to be happening, regardless of which camp we belong to.

Therefore, and by way of conclusion, when we consider looking at the perceptions of teachers with the overarching question, "what is the teachers' role in promoting online collaborative dialogue in a self-organised

environment?" the answer will, to a greater or lesser degree depend, on whether they are the "believers" or not.

6.2 Final Thoughts

When using the case study approach it is easy and sometimes tempting to try to do too much with the data, as you become mindful how insightful the study can be considered once it arrives in the hands of different audiences who maybe expecting different things. Certainly, there are obstacles to overcome in terms of credibility and validity in a single case study design and, as I have discussed in the methodology, ones which cannot be easily overcome. Those realities cannot be ignored, particularly as, in terms of a sample, Class X was very small. So my belief is that it is finally useful to take a step back for the purposes of seeing the data for what it is and also seeing what it is not. This final section attempts to do this, by firstly making what may seem like a strong attempt to discredit the case study approach. However, I do this "cap in hand" in order to be as transparent as I can be, beginning with the first section, "the suspect case study" which discusses the advantages and disadvantages of using such an approach.

6.3 The "Suspect" Case Study

It is reasonable at this point to highlight and reflect upon the key issues of using a case study design, as whilst case studies are popular and common to many educational research papers, some researchers take exception to the case

study approach, on the basis that the case study paradigm recognises the importance of the subjective human creation of meaning, rather than the scientific notion of objectivity. There are, for example, researchers who believe that reality can only be discovered via systematical controlled scientific methods which are universal, objective and quantifiable, whilst on the other, researchers who view that individual reality is true for the person because he or she experiences it. On this latter view, science fails to recognise the ability of human beings to interpret and make sense of his or her world (Van Manen, 1995). In the case of this study, the latter was more fitting because the case was presumed unique and needed to be studied in depth. Consequently, there was, in this instance, a very deliberate attempt to describe this case phenomenologically as it represented for me a situation I did not fully understand but nonetheless had the desire to.

However, the reality is it is not always possible to convince people how credible your case study is particularly as, for some, positivism is the only accurate depiction of reality. However, it is fair to say that suspicions about the case study approach has been challenged as a broader definition of social scientific enquiry has emerged. This allows for much greater flexibility in the designs of methodologies and thus, the case study has become more acceptable within a research context. Berger and Luckman (1966) and Gehlen (1988) for example believed this allows for the examination of human agency or a sense of world openness and, with this view, one might argue that we are able to see more truth and reality when we view a person as a relational being. Therefore, the

“suspect” case study is somewhat of a paradox, for much of what we know about the empirical world has been generated by case studies and case studies continue to constitute a large proportion of work generated by the social science disciplines. Nevertheless, they still maybe unappreciated by virtue that they do not hold true “warrantable human knowledge”, as human belief and perception is considered to be unverifiable (Hammond and Wellington, 2013 p. 121). It is certainly true that the case study research design is still viewed by some methodologists with a degree of caution.

This is particularly the case where the focus of attention is on a single example of a broader phenomenon and where qualitative analysis is the predominant method. This is frequently associated with loosely framed and non-generalisable theories, biased selection cases, informal research designs, subjective conclusions and non-replicability, to name but a few. Certainly, within the social sciences, the identification of a causal pathway has come to be seen as integral to analysis, regardless of whether the evidence is qualitative or quantitative. Additionally, we should also be mindful that this case study does not benefit from having any comparative data, which neither increases the opportunities for creating theory-connected generalisation, nor give the more highly regarded “replication” which supports a more positivist approach. However, Yin (2014) reasoned that there is no broad distinction between single and multiple case studies as both should be considered within the same methodological framework. Additionally, some single case designs, particularly those which are deliberately unique such as Class X, cannot be satisfied by

multiple cases as they are, quite simply, one of a kind and are thus are seen as creating “a small step toward generalisation in a case counter to the rule” (Stake 1995, p. 125). Therefore, whilst it is clear that in having a multiple case design, we can satisfy the conditions of an exemplary case study more readily, in some cases it is not possible and we should as researchers be prepared to challenge these views in defence of the uniqueness we have deliberately sought out. So, in essence I should be prepared for this and be prepared to stand behind the data, just as I stand behind the case study approach. As Yin (2014) convincingly stated, a good researcher will be enthusiastic and inspired about their research and it is my hope that this will be evident to those who read it with an open mind.

As I have argued, I skate on thin ice here, because whilst we should as researchers, be conscious of trying to satisfy the critics, we should not lose sight of what the research questions are asking of us and what we as researchers are trying to achieve by using the case study approach. It is also useful to remember that a well constructed case study which has a clear methodological description can be more useful for describing descriptive inferences, which was the case with Class X. Consequently, one could argue that it is more important to closely bind the case in order to define the units of analysis from which the research data will be generated, than it is to pick an approach to satisfy what counts as data. Gerring (2004) provides a useful example here in his consideration of the eight desirable characteristics which are relative to the construction of the “ideal type” of case study research design;

that of inference, scope of proposition, unit homogeneity, causal insight, causal relationship, research strategy, useful variance and ontology. For Gerring, these represent how the case study can be best understood as an ideal-type and not a method with “hard and fast rules” (Gerring 2004, p. 346). Thus, one of the strengths of the case study method is the depth of analysis it offers, which is a departure from the “thinness of cross unit studies” which say little about individual cases (Gerring 2004, p. 346). So, whilst it is useful and good practice to think about a wide range of available approaches to analysis, what is more critical is to clarify the research and keep the analysis at the heart of the data collection (Hartas 2010). This would indeed, represent my argument for the case study approach well. As Stake (1995) reiterated, if we worry too much about having enough to say about the case for the reader’s sake, or the case’s sake, we loose what is needed in the first place. That is, an atypical case which provides readers with an insightful read and hopefully an opportunity to make their own interpretations, out of their own interest.

6.4 The Sovereign Researcher

As discussed in the methodology, there was a conscious effort on my part to avert from the “overtly sovereign” authoritative researcher stance towards a more dialogic dimension, where the participants are entwined within the data itself. As this research does not seek to make claim to objective “truth”, rather it aims towards knowledge construction resulting from an interaction of the researcher and research participants, I made use of some ethnographical

techniques. This created a practical union between the tradition of interprevitism and ethnography, both of which formed an important part of this research design for two main reasons. Firstly, because subject selection in qualitative research is considered to be purposeful and enhances the understanding of the phenomenon under study and, secondly, because subject selection is critical to Class X, as students are only selected to be part of the program if they satisfy a specific set of criterion. Given this criterion is judged on the basis of observable behaviours and academic ability, missing the opportunity to see how the candidates who had applied to Class X were assessed in the first instance would be short sighted, as I believed the information added to the credibility of the study; being in keeping with the participant observer approach by opening up the possibility to build upon the relationship, in Nader's "study up" approach afore discussed.

However, there will be critics of such an approach, particularly relating to how conducting an ethnographic approach may substantiate a preconceived position thus rendering a researcher more susceptible to swaying towards supportive evidence rather than contrary evidence. Although avoiding bias is effectively one facet of research ethics that need to be considered in every research project, here they are particularly pertinent. This is because of the possibility that alternate positions and explanations have not been followed through. But as Stake (1995) reminds us, with a closely bounded case such as Class X we are only looking at a few aspects of the case and therefore endeavour to choose opportunities identified partly by the issues in order to "draw attention to

it as an object rather than a process" (Stake 1995, p. 2). Furthermore, the case is an integrated system, the central tenet being that there is a need to explore the phenomenon of Class X in depth and within its natural context. Therefore any attempt to exert control over and manipulate the variables of interest to make it less irrational and more scientific would render the case study less useful. So, we need to accept the study for what it is, which at times means we wait in vain for answers, because a case study will not always provide one.

So in essence, when studying a case of this nature, both researcher and reader should not expect to reach the end of the research and find a punchline. The fact that I considered that my overarching research question could be broadly answered by the hypotheses that it depends if they are the "believers" or not is indeed my opinion and readers will naturally, draw their own conclusions. Van Manen (1995) gives a good example of this, where she discussed how the readers of a case study frequently wait in vain for the answers, which in the context of an interpretative design is inappropriate, as one cannot summarise a phenomenological study as the study itself is the result. Therefore, what is key here is that the case study method is understood as a way of defining cases and not of analysing them. Therefore, they cannot be considered as a way to model causal relations, which are more associated with positivist connotations (Gerring 2004; Hammersley and Atkinson 1995, p .233). The findings of a single case study study are, therefore, intended to analyse one particular situation, and to arrive at certain concepts that may explain what is happening. This means that the findings should be best regarded as provisional, in that they

open the door to further research opportunities. Indeed, the case study should be regarded as a starting point or platform that serves as “a descriptive or exploratory foundation” which helps with the development of theory (Punch and Oancea 2009, p. 61). For this reason, it seeks the accurate but limited understanding case studies are frequently associated with, given the results are, on the whole, subjectively interpreted, and following the tradition of qualitative research (Stake, 1995).

6.5 Technology and the Teacher

I arrive at the point in which I need to consider if this study has revealed anything significant about Technology and the Teacher, particularly how important one is to the other in the context of the teachers’ perceptions of online collaborative dialogue. I came to the tentative conclusion that the perceptions of teachers about online collaborative dialogue is linked to whether or not they believe in technology. This idea seems to align with much of Ellul’s theory, that the human individual is becoming, to an ever-greater degree, the object of certain techniques and their procedures. This I conjectured on the basis that the teachers’ belief that technology represents value results in their positive projection about technology, or as Ellul would put it, is evidence that they have been “profoundly technicised” (Ellul 1962, p. 398). This is because they appeared to see no counterbalance to Ellul’s technique. Heidegger termed this as an example of how modem objectification towards technology transforms itself into the loss of the world. For Heidegger, taking this view results in the

subject (in this case, the human) no longer having any place to stand within the world, because of the way they objectify technology. This results in the human no longer having any being with the world in which to position themselves in a grounded way; and in a sense this is what I am claiming about this study. This was suggested in the way the teachers perceived themselves as teachers, because they had implied that the technology was the most important factor to online collaborative dialogue and not their guidance and mastery. For them, the technology was the most important value.

Whilst you may decide for yourself if this is or is not the case, from the teachers' perspective, they are the believers, who have taken what Prensky would term the path of least resistance. Heidegger saw this to represent the reduction of man, for his main and singular interest was with deciphering the meaning of Being. For Heidegger, the whole history of Western thought has shown a preoccupation with objects that are, to the neglect of the Being. However, despite Heidegger's belief that Being should be the concern of every man, he also approached philosophy from a phenomenological perspective. For Heidegger believed that the task of ontology is to explain Being itself and realise that all the rigours in the world can not make scientific knowledge a final goal.

From Heidegger's viewpoint, a proper method for such an ontology that seeks to lay bare and explicate the meaning of Being, is a descriptive phenomenology. Consequently, the philosophies of Heidegger have their foundation in an

analysis of human existence, which is arguably similar to the 'case study' approach used in this EdD. The idea that epitomised Heidegger's work was to develop the Being from a description of the lived experience of the world, as opposed to the abstract picture of the world. This is in line with Van Manen's insistence that phenomenology must seek the things that present themselves to us in a genuinely original way, because phenomenology as a discipline has the task to describe what is genuinely given to us in experience. Phenomenology must, therefore, embrace a pure description of what is. Consequently, when we refer back to the idea that the teachers' perceptions are guided by the idea that there is a distinct category of people who have a technological mindset, it is logical that they would also believe that technology will affect the way in which we communicate and seek to adapt and adopt more collaborative learning techniques in their classroom practices. Whatever the case maybe and however comfortable, or discomfited, we are with the idea of this new technology permeating the classroom, it seems plausible that it is a conversation that is going to be happening, regardless of which "faith" we belong to.

References

Abraham, J. (1996). "Positivism, prejudice and progress in the sociology of education: Who's afraid of values ?" *British Journal of Sociology of Education, 17* (1) pp. 81-6.

Ackermann, E. K. (2004). Constructing Knowledge and Transforming The World. In Tokoro, M. & Steels, L. (2004). *A Learning Zone Of One's Own,* pp. 17-35. IOS Press.

Adams,C. and Yin, Y. (2015). The World of MOOCS for a Child: The Case of Dino 101, *Global Learn* 15, (1) pp. 694-698.

Anderson, T. and Dron, J. (2011). Three Generations of Distance Education Pedagogy, *International Review of Research in Open and Distance Learning, 12. (3).*pp. 80-97

Aoki, T,T. (1999). Chapter Twelve: Toward Understanding "Computer Application" in *Contemporary Curriculum Discourses: Twenty Years of JCT 70*, pp. 168-176.

Aristotle (1981). *The Politics*. (T. A. Sinclair trans). London: Penguin Books.

Austin, J.L. (1962). *How To Do Things With Words*, 2nd Edition, ed. J.O. Urmson and M. Sbisá. Cambridge, MA: Harvard University Press.

Barbour, M.K. and LaBonte, R. (2015). State of the nation: k-12 e-learning in Canada. Abbreviated edition. *Canadian e-Learning Network*, doi:10.13140/RG.2.1.2872.9207.

Bassey, M. (2001). A solution to the Problem of Generalisation in Educational Research, *Oxford Review of Education*, *27*, pp. 5-22.

Bayne, S., and Ross, J. (2014). *The pedagogy of the Massive Open Online Course: the UK view*, University of Edinburgh.

Becker, H.S. (1998). *Tricks of the trade: How to think about your research while you're doing it*. Chicago: University of Chicago Press.

Bennett, S. J., Maton, K. A., and Kervin, L. K. (2008). The 'digital natives' debate: a critical review of the evidence. *British Journal of Educational Technology, 39*, pp. 775-786.

Benson, P., and Voller, P. (Eds.). (1997). Introduction in P. Benson and P. Voller (Eds.). *Autonomy and independence in language learning.* New York: Longman.

Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, pp. 77-101.

Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A.D., and Seaton, D. T. (2013). Studying learning in the worldwide classroom: Research into edX's first MOOC. *Research and Practice in Assessment, 8*, pp.13-25.

Brown, J, S. (2000). Growing Up: Digital: How the Web Changes Work, *Education, and the Ways People Learn, Change: The Magazine of Higher Learning, 32*, pp.11-20.

Bruffee, K. (1993). *Collaborative Learning : Higher Education, Interdependence, and the Authority of Knowledge,* 2nd Edition, London, John Hopkins Press Ltd.

Bruyn, S,T. (1966). *The Human Perspective in Sociology.* New Jersey, Prentice-Hall.

Buckingham, D. (2007). *Beyond Technology: Children's Learning in the Age of Digital Culture,* London, Polity Press.

Christensen, P.M. (2000). *Research with Children: Perspectives and Practices,* London, Falmer Press.

Cohen, L., Manion, L., and Morrison, K. (2011). *Research Methods in Education,* (7th Ed), Oxon, Routledge.

Christensen, C. M., Horn, M. B., and Staker, H. "*Is K-12 Blended Learning Disruptive? An introduction of the theory of hybrids.*" 2013 San Francisco, CA. Retrieved from http://www.christenseninstitute.org/wp-content/uploads/2013/05/Is-K-12-Blended-Learning-Disruptive.pdf.

Colley, A.M., Gale, M.T., Harris, T.A. (1994). Effects of Gender Role Identity and Experience on Computer Attitude Components, *Journal of Educational Computing Research, 10*, pp.129-137.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Cushman, P. (1995). *Constructing the self, constructing America: A Cultural history of psychotherapy*. Boston: Addison-Wesley.

Dede, C. (2008). *The importance of collaboration featuring Dr. Chris Dede*. Walden University: Laureate Education, Inc.

Dennett, D. C. (2015). *Why and How Does Consciousness Seem the Way it Seems?* In T. Metzinger and J.M. Winds (Eds.), Open MIND: 10(T). Frankfurt am Main: MIND Group.

Denscombe, M. (1998). *The Good Research Guide: For Small Scale Social Research Projects,* New York, Open University Press.

Dewey, J. (1897). My pedagogic creed. *The School Journal, 3,* pp. 77-80.

Dietz-Uhler, B., and Bishop-Clark, C.(2002). Designing the undesignable: Social software and control, *Psychology Learning and Teaching, 2,* pp. 25-31.

Ellul,J. (1964). *The Technological Society*, New York, Knopf.

Facer, K., and Furlong, R. (2001). Beyond the Myth of the “Cyberkid”: Young People at the Margins of the Information Revolution, *Journal of Youth Studies,* 4, pp. 415-469.

Geertz, C. (1973). Thick description: toward an interpretive theory of culture, in*: The interpretation of cultures: selected essays*,4, pp. 3-30.

Gerring, J. (2004). What Is a Case Study and What is it Good for? *American Political Science Review*, *98*, pp. 341-354.

Goodwin, D., Pope, C., Mort, M., Smith, A.(2003). Ethics and ethnography: An experiential account*. Qualitative Health Research,* 13, pp. 567–577. doi: http://dx.doi.org/10.1177/1049732302250723. [PubMed]

Greene, J. and Caracelli, V. (2003). "*Making Paradigmatic Sense of Mixed Methods Inquiry"*, in Handbook of Mixed Methods in Social & Behavioral Research, Tashakkori, A & Teddlie, C. (Eds) 2003, Sage, California.

Hammersley, M., and Atkinson, P. (1995). *Ethnography: Principles in Practice,* London, Routledge.

Hammond, M. (2016). Online collaboration and cooperation: The recurring importance of evidence, rationale and viability, *Education and Information Technologies, 22,* 3, pp.1005-1024.

Hammond, M., and Wellington, J. (2013). *Research Methods : The Key Concepts*, Oxon, Routledge.

Hargittai, E., and Hinnart, A. (2008). Digital inequality: differences in young adults use of the Internet*, Communication Research, 35*, pp. 602–621.

Harri-Augstein, E., and Thomas, L. (1991). *Learning Conversations: the self-organised learning way to personal and organisational growth*. London: Routledge and Kegan Paul.

Hartas, D. (2010). *Educational Research and Inquiry: Qualitative and Quantitative Approaches,* Continuum, London.

Heidegger, M. (1977). *The Question Concerning Technology and Other Essays*, New York, Harper and Row Publishers.

Heidegger, M. (1968). *What is Called Thinking* ? New York, Harper Row Publishers.

Hitchcock, G., and Hughes,D. (1998). *Research and the Teacher: A Qualitative Introduction to School-Based Research*, Routledge, New York.

Illich, I. (1971). *Deschooling Society*, Harper and Row, New York.

Johnson, S,D., and Aragon, S.R. (2003). An instructional strategy framework for online learning environments*, New Directions for Adult & Continuing Education, 100*, pp. 1-101.

Karau, S. J., and Williams, K. D. (1995). Social loafing, research findings, implications, and future directions. *Current Directions in Psychological Science, 4*, pp. 134-140.

Karnieli-Miller et al. (2009). Power relations in qualitative research, *Qualitative Health Research, 19*, pp. 279-89.

Karsenti,T. (2013). MOOC: What the research says. *International Review of Technology in Higher Education. 10.* pp. 23-37.

Keller, F.S. (1968). GOOD-BYE, TEACHER.. .' *Journal of Applied Behaviour Analysis*, 1, pp. 79-89.

Kennedy, G., Krause, K., Judd, T., Churchward, A., and Gray, K. (2006). First Year Students' Experiences with Technology: Are They Really Digital Natives? Melbourne, Australia: University of Melbourne. Retrieved April 10, 2007, from http://www.bmu.unimelb.edu.au/research/munatives natives_report2006.rtf.

Kerr, B. (2006). *A Challenge to Connectivism.* Transcript of Keynote Speech, Online Connectivism Conference. University of Manitboa. http:// ltc.umanitoba.ca/wiki/index.php?title=Kerr_Presentation.

Kerr, B. (2007). Msg. 1, *The invisibility problem*. Online Connectivism Conference: University of Manitoba. http://ltc.umanitoba.ca/ moodle/mod/forum/ discuss.php?d=12.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., and Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist,* 53, pp. 1017-1031.

Kvale,S. (1996). *Interviews: An Introduction to Qualitative Research Interviewing.* Thousand Oaks, Sage.

Koehler, M. J., and Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9*, pp. 60–70.

Kop, R., and Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *International review of Research in Open and Distance Learning, 9,* pp. 1-13.

Le, H.H., Janssen, J.J.H.M., and Wubbels, T. (2018). Collaborative learning practices : teacher and student perceived obstacles to effective student collaboration, *Cambridge Journal of Education, 48,* pp. 103-122.

Li, Y., and Ranieri, M. (2010). Are 'digital natives' really digitally competent? – A study on Chinese teenagers. *British Journal of Educational Technology*, n.p.doi: 10.1111/j.1467-8535.2009.01053.x.

Lieberman, M.D. (2015). Social : *Why our brains are wired to connect,* Oxford, Oxford University Press.

Lincoln, Y.S., and Guba, E. (1985). *Naturalistic Inquiry :* Beverley Hills, CA: Sage.

Livingstone, S. (2011). "Digital Learning and Participation among Youth: Critical Reflections on Future Research Priorities." *International Journal of Learning and Media 2*, pp. 1-13.

Livingstone, S., and Bober, M. (2004). Taking up Online Opportunities? *Children's Uses of the Internet for Education, Communication and Participation,* E-Learning and Digital Media, 1, pp. 395 - 419.

Livingstone, S., and Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New media & society*, 9, pp. 671-696.

Lowry, P. B., Roberts, T. L., Romano, N. C., Cheney, P. D., and Hightower, R. T. (2006). The impact of group size and social presence on small-group communication: Does computer-mediated communication make a difference? *Small Group Research*, 37, pp. 631–661. Retrieved from http://dx.doi.org/10.1177/1046496406294322.

Lyotard, J.F. (1984). *The Postmodern condition: A report on knowledge*. *In Theory and History of Literature,* Manchester: Manchester University Press.

McClintock, R., and Taipale, K. (1997). *Computer Mediated Communication,* Retrieved from http://www.ilt.columbia.edu/academic/classes/TU5020/TU5020SY.html.

Merriam, S.B. (1988). *Case Study Research in Education*, San Francisco: Joseey Bass.

Miles, M.B., and Huberman, M. (1994). *Qualitative Data Analysis*, London, Sage.

Mitra, S., and Rana, V. (2001). Children and the internet: Experiments with minimally invasive education in India. *The British Journal of Educational Technology, 32*, pp. 221–232.

Mitra, S. (2003). Minimally invasive education: a progress report on the 'hole-in-the-Wall' experiments*. British Journal of Educational Technology*, *34*, 3, pp. 367–371.

Mitra, S. (2005). Self organising systems for mass computer literacy: findings from the 'hole in the wall' experiments. *International Journal of Development Issues, 4,* pp. 71–81.

Mitra, S. (2006). *The hole in the wall: self-organising systems in education.* New Delhi & New York: Tata-McGraw-Hill Publishing.

Nader, L. (1969). *Up the anthropologist: Perspectives gained from "studying up"* In: Hymes D, editor. *Reinventing Anthropology.* New York: Pantheon Books; 1972/1969, pp. 284–311.

Niederhauser, D,S. and Stoddart, T. (2001). Teachers' instructional perspectives and use of educational software, *Teaching and Teacher Education 17*, pp. 15-31.

Oblinger, D., and Oblinger, J. (2005). Is it Age or IT: First steps towards understanding the net generation. In D. Oblinger., and J. Oblinger (Eds.), *Educating the Net Generation*,2,2-20). Boulder, CO: EDUCAUSE. Retrieved March 31, 2006, from http://www.educause.edu/educatingthenetgen.

Papert, S. (1980*). Children, Computers, and Powerful Ideas*, New York, Basic Books.

Parkin, F. (1982). *Max Weber*, London, Chichester and Tavistock Publications.

Partoseodarso et al (2013). Exploring University Students' Use of Ict, *University of Ontario Institute of Technology*, Canada.

Patton, M. (2002). *Qualitative research and evaluation methods.* 3rd Sage Publications; Thousand Oaks, CA.

Postman, N, (1993). *The Surrender of Culture to Technology,* New York, Vintage Books.

Postman, N. (1995). *The End of Education - re Defining the value of School,* Westminster, Random House, Inc.

Prenksy, M. (2001a). Digital Natives, Digital Immigrants*. On the Horizon,* 9(5), pp. 1-6.

Prenksy, M. (2001b). Digital Natives, Digital Immigrants*,* Part II. Do they really think differently? *On the Horizon,* 9(6), pp. 1-6.

Prensky, M. (2009). H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom*, Innovate: Journal of Online Education,* 5(3).

Prensky, M. (2013). *Brain Gain : Technology and the Quest for Digital Wisdom,* New York, St. Martin's Press.

Punch, K.F., and Oancea, A. (2014). *Introduction to Research Methods in Education,* (2nd Ed) London, Sage.

Rosen, L,D., Whaling, K., Carrier, L.M., Cheever,N.A., Rokkum,J. (2013). The Media and Technology Usage and Attitudes Scale: An empirical investigation, *Computer Human Behaviour*, 1, pp. 2501–2511.

Salmon, G. (2000). *E-moderating: the key to teaching and learning online*, London, Kogan Page.

Sanchez, J., Salinas, A., Contreras, D., & Meyer, E. (2010). *Does the new digital generation of learners exist? A qualitative study. British Journal of Educational Technology*, 42, pp. 543-556.

Scardamelia, M., and Bereiter, C. (1991). Higher Levels of Agency for Children in Knowledge Building: A Challenge for the Design of New Knowledge Media*, The Journal of the Learning Sciences*, 1, pp. 37-68.

Schwandt, T. (1998). *Constructivist, Interpretivist Approaches to Human Inquiry.* Handbook of Qualitative Research, California: Sage.

Searle, J.R. (1976). *A Classification of Speech Acts, Language in Society*, *5*, pp. 1-23.

Selwyn, N. (2009). The digital native – myth and reality*, Aslib Proceedings*, 61, pp. 364-379.

Siemens, G. (2008a). *About: Description of connectivism. Connectivism: A learning theory for today's learner,* http://www.connectivism.ca/about.html.

Siemens, G. (2008b). *Learning and knowing in networks: Changing roles for educators and designers*. Paper 105: University of Georgia IT Forum. http://it.coe.uga.edu/itforum/Paper105/Siemens.pdf.

Siemens, G. (2005). *Connectivism: Learning as Network Creation*. e-Learning Space.org website. http://www.elearnspace.org/Articles/networks.htm.

Siemens, G., and Downes, S. (2009). *elearnspace*. Retrieved from http://www.elearnspace.org/blog.

Stake, R.E. (1995). *The Art of Case Study Research*, California, Sage.

Sung, E., and Mayer, R,E. (2012). When graphics improve liking but not learning from online lessons*, Computers in Human Behaviour, 28,* pp.1618–1625.

Surowiecki, J. (2004). *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations,* New York, Anchor Books.

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*, 22, pp. 306-31.

Tapscott, D. (1998). *Growing up Digital - The Rise of the Net Generation*, New York, McGraw-Hill.

Tapscott, D., and Williams, A.D. (2006) *Wikinomics: How Mass Collaboration Changes Everything*, London, Penguin Publishing Group.

Vallor, S. (2012). Flourishing on Facebook: Virtue Friendship and New Social Media*, Ethics and Information Technology*, 14, pp. 185–199.

Van Manen, P.E. (1997). *Researching lived experience: Human science for an action sensitive pedagogy*, London, Ontario, Canada, Althouse Press.

Veen, W., and Vrakking, B. (2006). *Homo Zappiens: Growing up in a digital age.* London,UK: Network Continuum Education.

Verhagen, P. (2006). *Connectivism: A new learning theory?* Surf e-learning themasite, http://elearning.surf.nl/e-learning/english/3793.

Wellman, B, Quan-Haase, A., Boase, J., and Chen, W. (2002). *The Internet in Everyday Life.* 10.1002/9780470774298.ch2.

Yin, R.K. (1984). *Case Study Research: Design and Methods*. Sage Publications, Beverly Hills, California.

Yin, R. K. (1994). *Case Study Research Design and Methods: Applied Social Research and Methods Series*. Second edition. Thousand Oaks, CA: Sage Publications Inc.

Yin, R.K. (2002). *Applications of Case Study Research*, California, Sage.

Yin, R.K. (2014). *Case Study Research - Design and Methods*, California, Sage.

Appendices

8.1 Extract from Interview One

R : What were your initial thoughts about how online collaborative dialogue could be increased in the classroom?

T : I gave the class - was about 26 students I think, maybe more a challenge after reading about students who created their own video games. I thought OK, if a Grade 1 can do it why aren't we giving it a shot? But you know this isn't quite Science and Math as other people think. This is like a bit out there, but I'm thinking …. whats the worse that can happen.

R : So can you explain what happened as a result of that?

T: The group was terrified but there was excitement, but there also so much fear.

R : Fear of what do you think?

T : The computer. Like we can't do that we don't now how. Where are the books, like where are the instructions right now. Im thinking you don't need a book you need to trial and error guys.

R : OK so how did they make a start, I mean if they didn't know anything about using the computer?

T : Ok well the kids like they knew the computer but not to use like I wanted them to. I mean look at any kids bag they usually have a phone right ? But

these kids know a lot but they aren't channelled right. They use their computer but they don’t use a computer.

R : So when you say that they don’t use the computer what do you mean by that?

T : They don’t learn how powerful the computer can be - they don’t use it in the classroom - it’s just like You Tube or whatever the latest think is. Like celebrity culture, like who is wearing what. Not important cool stuff.

R : So how did you encourage them to look at it differently. Sorry I mean how did you begin to change their attitude to it ?

T : That exact moment, maybe it was just a process.

R : So do you think it happened over time perhaps or something else ?

T : I just kept setting them tasks and then they were gone. So once they overcame that initial resistance, that doubt, things literally took off in the classroom.

R : I see, what did you see as being the crucial change in the classroom?

T : The way I see it is computers are just part of advanced technology. Like artificial intelligence of wearable sensors. They’re a tool. Teachers of the future are going to need technology to help their students. That to me is obvious. Teachers are going to become facilitators - not robots. We wont be robotic teachers but robots might be part of that facilitation. Kids want this they want change and I saw this in the classroom. I mean we might not need teachers at all, we’re all going to be makers and creators.

R : So do you think the children themselves drove you to think about project X

T : Yes - they want this change. Let me show you this example. this is kids coding.

With no coding or programming experience, yes most students were apprehensive - but look see the enthusiasm look at the concentration. I love this bit. This kid at the start was like, no Mr XXXX I don't get it I cant do this. But this I am showing you is this same kid. Different.

R : You can see he is enjoying himself. What part do you think you played in that - I mean you say he was a bit disheartened

T : Disinterested too I think

R : What did you do to change his mind?

T : I showed him what he could do. Simple as that he did the rest I did nothing.

8.2 Extract from Interview Two

T : students we have selected for Class X have different online behaviours to their peers. They are more committed to use computers to learn because they are students who are already achieving higher grades

R : So what do you think specifically separates them from other students?

T : The fact they have academic drive. What you don't see with the other kids is this ability to see things for more than they are. So for example the other day they were like hey Ms XXX try this come sit here I'll show you. I was like sitting back and thinking this kind of seems weird but lets see what works. These students worked as a team with the technology because they are my good students, you know the ones that I don't have to trouble to get the better grades. They are the ones with their hands up I don't have to ask them for their work they are just on it. They don't just use computers for Facebook you know. I think these students stand out as different because they use their academic ability for a purpose.

T : I think what I mean is they are the performers in the classroom. You have to remember the underlying vision for Class X always to create this malleable workspace to expand what we believe is better for learning. That is, teaching in a type of networked learning space. That way we have no boundaries, so you know - we can invite professionals and other students to support other kids I

R : So do you believe that students who are more academic are more able or perhaps you mean more confident to use computers?

T: Well yes because they learn using a computer in a better and more informed way.

R: Do you have any particular examples of that?

T: Yes I think so. What I mean is that the higher grade students are more at ease with technology in the sense of - they use it for different purposes. So they have an academic base. So in this case, for me, it is clear that they have a technological base which I think makes it easier for them to collaborate online.

R: So have you seen a specific link between students academic ability and their ability to use technology?

T: Yes. All kids use computers to some extent. But what I see in the classroom but maybe more specifically in Class X is that the students we have selected already have a strong academic base. Therefore they approach learning already differently from other students. So when these students, I mean the more academic students, are given a computer and the right environment they use it for learning purposes. It's not been my experience otherwise to be honest.

R: So, in a sense you are quite confident in your experiences of teaching that students who are more academic and the most suitable students for Class X because they are able to use the computer for learning purposes.

T: Yes.

8.3 Extract from Interview Three

T: students need to have demonstrated a commitment to learn to be considered for Class X. The students already know how to use computers even from kindergarten but they most use them for just simple messaging. When I started in Class X I understood that our goal was to seek out the candidates who could show they could do more and wanted to do more and not just for gaming and the like at home.

R: So in your opinion, what separates the students of Class X from other students?

T: For me and I am only speaking for me I believe it has to do with how they see the computer and what it can do. I think the computer or more specifically the Internet will be more implicated in the way we teach or at least in the way we expect the children to learn. Maybe not today or tomorrow, but I think it will happen.

R: Do you mind elaborating on that ?

T: No not at all. I believe that the computer we know has particular effects on learning which we believe is more relevant than they we way we used to teach before. So when Mr ****** selects the students to take part he is only looking for students who are already performers in the classroom because they have shown the commitment for learning which makes them ideal for Class X. So when I think about that in terms of the implications of the computer - I think the opportunities are there if we are brave enough to see them.

R: So in terms of the students who are new to Class X, what do you see as being the main challenges at the start of the process. What I mean is - if they are already academically ahead of their peers and they are able to use a computer competently, what do you think is the first task for you as teachers? In Class X?

T: It is interesting as when they first start the term they think they know how to use the computer and its true they have ability far more than the other students. But by then end of the first semester and they have understood that the computer is the most important thing it is all they want to use. They use it in a different way, and this isn't hard as they already are skilled before they start.

R: I see, so do you believe the computer is the most important thing ?

T: Yes because to be able to communicate online in a productive way requires a certain amount of discipline I think because it is easy to become distracted by technology. The more capable students are more disciplined in this way and we don't have to worry about them playing games or going off subject.

T: I think what I mean is that the students in Class X make the better collaborators because they are quite smart already when it comes to computers. Maybe it comes more naturally?

R : I understand, so the technology is very important for students to collaborate? What I mean is would they collaborate without it?

T: Well yes and no. I would say the technology is the key - without it Class X would not exist.

8.4 Extract from Discussion One

T: “Discuss the key issues faced by Canada’s indigenous people.

S: OK

S: Great

S: Hi !

S. Hello to everyone!

S. Shout out!

S. LOL Hi.

S: Where you been?

S: No where LOL but hi !

S: Hello I’m online.

S: Really? Hi too.

S: Hello I’m here too.

T: So, we have all said hello to each other - can we get back to task. How do you think you are going to approach this question. Please discuss.

S: Sorry Mr XXXX

S: I missed this, sorry.

S; I missed something too, sorry

T: I note that in the following link, there is some suggestion that some indigenous populations are facing serious employment issues. Any comment ?

S: Thank you Mr XXXX”.

S: Sames.

S: Sames ? LOL.

S: Thanks I’m on it. Where are you xxxx?

S: Here and I said hello already.

S. Hello too.

T: ?

S. I will get this done.

S. I have started.

S. Hello again.

S. Shake down to you xxxx.

S.LOL.

S.Shake down?

S. Who says shake down what does it even mean?

S:NI

S.NIAA

S.Enough already.

S.Where you been?

S.Sorry Mr xxxx I am looking now.

S. Me too,.

S. Looking at what, who is there? Hello though.

S. Hello.

8.4 Extract from Discussion Two

T: Will robots be conscious one day ?”

S: Who is here?

S: Me

S: Where is XXXX?

S: Hello

S: Hello

S: I was here a while ago it was quiet.

S: Hello

T: What are your opinions about this ?

S: Hello to everyone!

S. Hi

S. Hi.

S: Hi

S: Hi and bye !

BREAK

T: Who believes that AI will replace humans ?

BREAK

T: OK Guys please find attached this Google Doc. I suggest you read and filter through what you need to answer this question. You will also find some web links that might find useful. Let me know at least !

S: Thanks !

S: Great

S: That’s going to be useful

S : I need that

S : Thanks for that document. I actually think I need that

S: Me too

S : xxxx did you get this

S : No but I did now

S : Thanks for this I couldn’t find much

S : Really ?

S : Hi

S: Where were you ??? Thanks

S: Thats super helpful actually

S: I agree to this

S: I second and third it

S: Saying hello here and thanks for the Gdoc

S : Gdoc works

S: Thanks great help

S: Awesome

CODE	SPEECH ACTS	FREQUENCY	PERCENTAGE
1	REPRESENTATIVE	3	2.3%
2	COMMISSIVE	9	7.1%
3	DIRECTIVE	21	16.6%
4	EXPRESSIVE	93	73.8%
5	DECLARATIVE	0	0%
	TOTAL	**126**	**100%**

1. Why do things fall down and not up or sideways?

2. Hello it's me

3. We can see

4. Hi

5. Hello

6. Hello

7. Hi

8. Hey XXXX", "Hi, how are you?

9. Fine, how are you?

10. Good

11. Hello again

12. Hello

13. Hey xxxx

14. Hi

15. Hi, how are you ?

16. Morning

17. Hi

18. Hellllooo

19. Sup

20. Hiya

21. I'm here hello

22. Hi Hi Hi

23. I'm here too

24. Me too

25. Checking in, hi

26. Tuning in, hi

27. Hi, hi all

28. Welcome to the new discussion lol lol

29. ha ha K hi

30. i said hi already but hi again

31. So, now you have had a chance to think about this, how are you going to approach it. 32. Discuss.

33. Where are we at with this? Hi by the way

34 . Hi I said Hi

35. Did you ? Hi then again

36. Hi xxxx

37. Hellllooo k

38. hellllooo k you too

39. Tell the rest of the group where you are thinking might be a good starting point.

40. Like I stated, tell the rest of the group what your starting point is

41. I would say we should be thinking about Newton?

42. https://www.teachervision.com/gravity/downhill-discoveries-experiments-momentum

43. https://www.scientificamerican.com/article/bring-science-home-free-fall/

44. Hey, xxxxxx, xxxxx and xxxxx, you ought to work with xxxx on this.

45. "I've found this. So who is going to help? Can we agree that I will start on the nature of orbits?"

46. Great xxxx

47. Good job

48. Sames

49. Great idea

50. Dope

51. Dope lol good idea xxxx

52. Thank you for this idea xxxx

53. I was looking at this on www. xxxxxxxxx.

54. Feel free to use these or perhaps think of your own

56. Share with the group or run your ideas past me ?

57. In fact, you can all run your ideas with me

58. Thanks

59. yeah thanks

60. useful

61. Thanks that's great

62. Awesome

63. Great

64. thanks xxxxx

65. Yup thanks

66. Thanks Mr xxxx

67. Thank you

68 Yeah great info

69. Useful

70. XXXX has given you a start, but I am not seeing the effort from the rest of you.

71. I've found this. So who is going to help?

72: Can we agree that I will start on the nature of orbits?

73. Who is going to work on this idea with xxxx?

74. ?

75. xxxxx you ought to do this one

76. Who is doing this - show of hands ?

77. XXXX has same this suggestion. It isn't appropriate no one has responded.

78. So, I will ask again,

79. if XXXX is starting on the nature of orbits - what are the rest of you contributing ?

80. S: Sorry

81. S: Sorry Mr xxxxx

82. S: Me too, apologies great idea

83. S: Sorry

84. Sorry

85. Yeah sorry xxxx

86. Not cool sorry

87. Sorry xxxx

88. Sorry too

90. sor

91. sorry boy

92. sorry

93. yeah sorry

94. I didn't see this sorry

95. TBH that sucks, sorry

96. Soooorrrrryyyy xxxxx

97. def not intended sorry

98. I have already done mine

99. I wonder if anyone of you have considered the coin experiment to verify this phenomenon?"

100 : I was think along the same lines xxxx. I suggest we split into groups and do this. Who is up for this ?

101 : I wonder if anyone of you have considered the coin experiment to verify this phenomenon?

102 : Good idea thanks

103. Our group have already considered this

104 : I might use that thanks

105 : Yeah I am going to look into this

106. We will be too

107 : Thanks

108. Nice

109 : I assume you all have seen XXXX's work about the sun being nothing more than a massive collection of all the matter from the formation of the solar system that wasn't moving sideways fast enough. Discussion ?

110 : That sounds great

111 : Good job xxxx

112 : Cool

113 : Well done from us all

114 : Good idea thanks

115. I might use that thanks

116. Thanks

117. That sounds great

118. Good job xxxx

119. Cool

120. Well done from us all

121. Looks good, great

123. Well done

124. Well done

125. Good job

126. Really cool